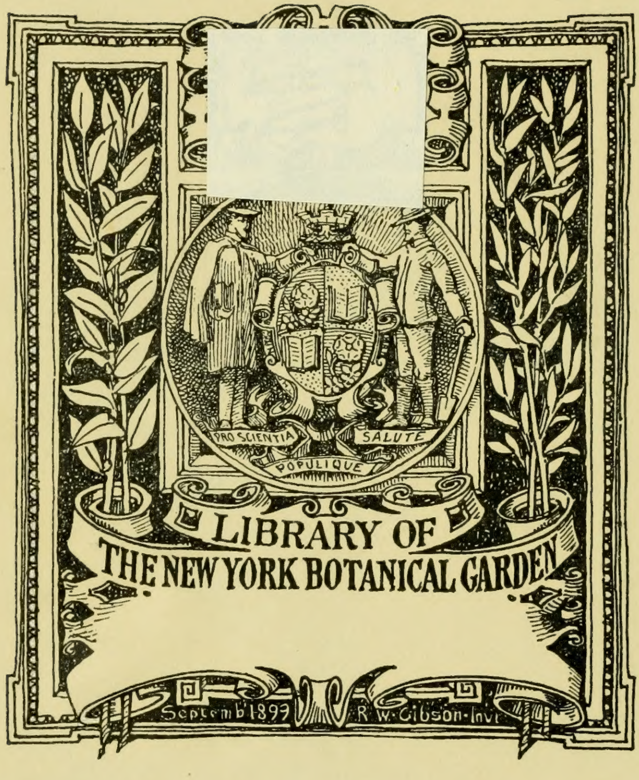
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BULLETIN No. 9.

U. S. DEPARTMENT OF AGRICULTURE,
DIVISION OF POMOLOGY.
GUSTAVUS B. BRACKETT, POMOLOGIST.

THE FIG:

ITS HISTORY, CULTURE, AND CURING

WITH

A DESCRIPTIVE CATALOGUE OF THE KNOWN
VARIETIES OF FIGS.

BY

GUSTAV EISEN, Ph. D.

1862 1889

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1901.

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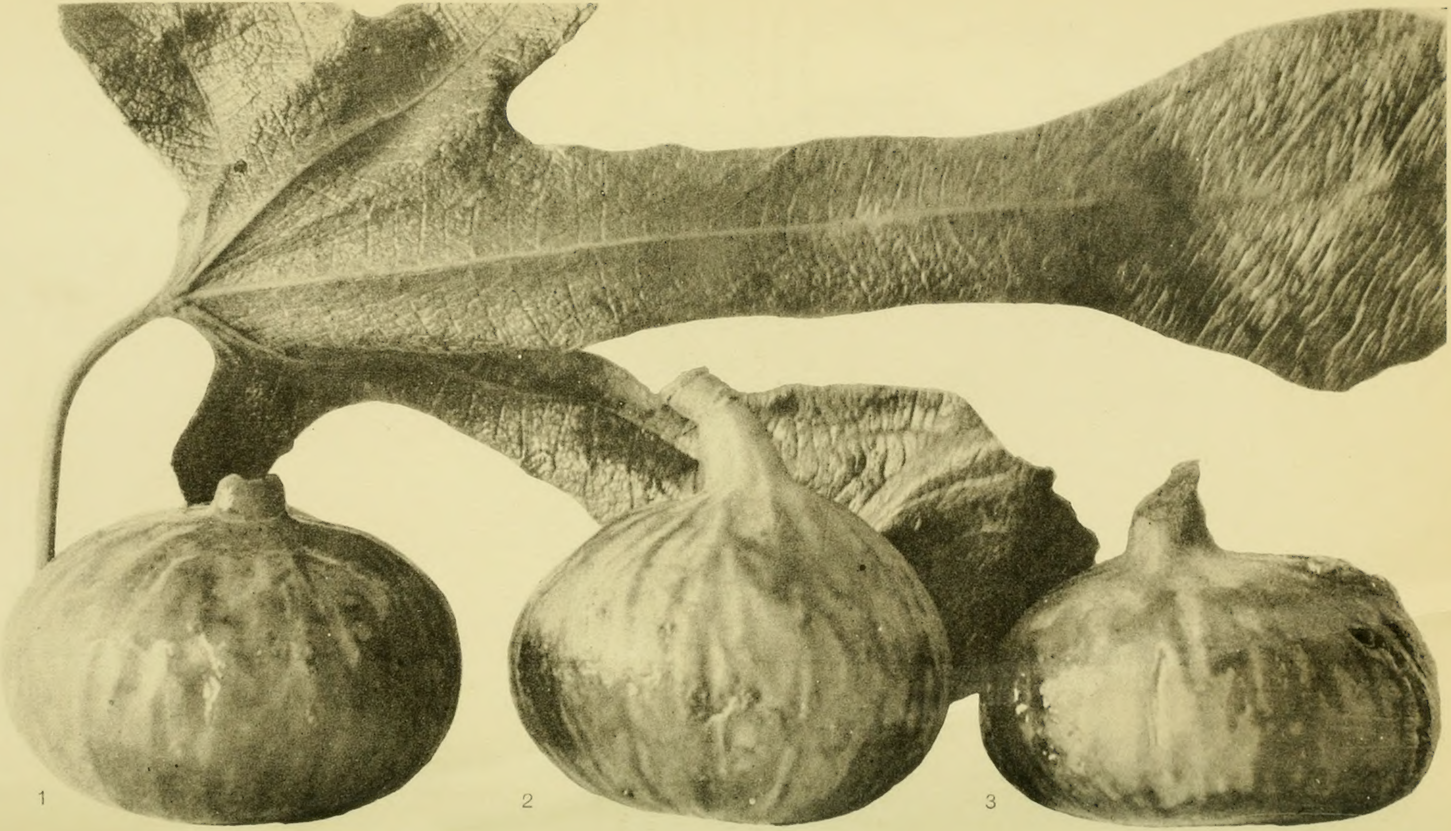

RIPE SMYRNA FIGS GROWN IN CALIFORNIA. (PHOTO. BY G. P. RIXFORD.)

HELIOTYPE CO., BOSTON.

DESCRIPTION OF FRONTISPIECE.

The frontispiece represents three specimens of Smyrna Figs matured at Fresno in the month of August, 1900. All three specimens were grown on the Roeding place and caprificated by Mr. E. A. Schwarz, of the United States Department of Agriculture. Photograph reproduced by courtesy of Mr. G. P. Rixford.

Fig. 1, from cuttings imported from Smyrna by Mr. F. Roeding. Skin and pulp white. Fig. 2, from cuttings imported by the Bulletin Company in 1882. Skin and pulp brownish yellow or reddish. Fig. 3, from cuttings imported from Smyrna by the Bulletin Company in 1882. Skin and pulp white. The same variety is represented in fig. 1. The leaf is from fig. 1.

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LETTER OF TRANSMITTAL.

U. S. Department of Agriculture,
Division of Pomology,
Washington, D. C., June 14, 1901.

Sir: I have the honor to transmit herewith, and to recommend for publication as a bulletin of this division, the manuscript of an article on The Fig: Its History, Culture, and Curing, with a descriptive catalogue of the known varieties of figs, prepared by Dr. Gustav Eisen, of San Francisco, Cal.

Dr. Eisen is too well known as an author of high standing to need any introduction to the horticultural world. His name carries with it a guaranty of the value of this, his latest work.

The recent successful introduction of the blastophaga into the fig-growing sections of the United States by the Department of Agriculture almost certainly assures the production of first-class Smyrna figs, which will doubtless greatly encourage and stimulate the industry, and thereby create an increase in the demand for reliable literature on the subject.

This comprehensive treatise contains information of value to the scientific and practical fruit grower never before published in the form in which it is here presented.

Very respectfully,

G. B. Brackett,
Pomologist.

Hon. James Wilson,
Secretary.

PREFACE.

The earliest observations on which this bulletin is based were begun many years ago, during the author's visit to the fig districts of the Mediterranean countries. Later on investigations were made in Mexico, Central America, and California, principally in the latter.

My researches have been greatly aided by many friends and sympathizers. Among the officials of the United States Department of Agriculture I have received much help and encouragement from Dr. L. O. Howard, Chief of the Division of Entomology, while Col. Gustavus B. Brackett and Mr. William A. Taylor, the former, Chief and the latter Assistant Pomologist, have assisted me in every possible manner at much sacrifice of their own valuable time. Mr. E. A. Schwarz, of the Division of Entomology, has given me much information about the *Blastophaga*, and helped me in regard to the literature, from which he has made extracts for my use. Mr. Newton B. Pierce, of the Division of Vegetable Physiology and Pathology, has contributed two photographs taken by him in Sicily. The Paddock & Fowler Company, of New York, has kindly given me for publication a number of photographs illustrating the packing of figs, etc., taken by them for special use in this bulletin. From foreign scientists I have received aid from Graf Solms-Laubach, of Germany, and from Dr. Paul Mayer, of Naples, both having sent me rare and valuable caprifigs for trial in this country. In California I have repeatedly had assistance from Mr. E. W. Maslin, Mr. Felix Gillet, Mr. George O. Mitchell, Mr. John C. Jones, Mr. G. P. Rixford, and Dr. W. J. V. Osterhout. I am especially indebted to Mr. John Rock, of Niles, without whose assistance this bulletin could never have been published in its present form. Besides his own collection of figs he has also cared for that imported by the United States Government from the Royal Horticultural Society of London, both collections having been at my disposal for experiment and study. Dr. Peder S. Bruguiere, of San Francisco, has taken for my use a number of photographs illustrating figs and fig trees, some of which are used in this memoir. To these gentlemen, as well as to all others who have aided me in my work, I wish here to express my gratitude.

MAR 26 1929

GUSTAV EISEN.

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THE FIG: ITS HISTORY, CULTURE, AND CURING.

CHAPTER I.

INTRODUCTORY.

NAME AND DERIVATION.

The English word "fig" is of very ancient origin, and is derived from the Latin "ficus" and the yet older Hebrew name "feg." The English word must have originated during the Roman invasion of England, when probably the first fig trees were planted in English soil. As early as 1250 the word was in general use in a commercial sense, as "figges" or "fegges" constituted one of the products regularly imported into England, especially from Portugal and Spain.

The wild fig, the ancestor of the edible fig race, is unknown in English-speaking countries, except, of course, where found as botanical specimens. In the semitropical Mediterranean districts this wild fig is met everywhere except in the north of Italy and the Riviera and in the south of France. In Italy the wild fig is known as the "profico," "fico selvaggio," or "caprificus," the last name being derived from capra (goat) and ficus (fig), and indicating the worthlessness of the fruit for eating purposes. From "caprificus" is derived our name "caprifig" and the French "caprifiguier." In Spain it is known, in some districts, at least, as the "caprahigo." In Greece it is called "erineos," while the edible fig is there known as "sycon" (*συκον*). In Hebrew the edible fig was "tĕena," in Aramaic "tênâ," and in Arabic it is "tîn." It may not be out of place also to note that the name of another celebrated fig variety, the "Sycamore," of Egypt, is derived from the Greek "sycon" (fig) and "moro" (mulberry), meaning mulberry fig, on account of the peculiar arrangement of the fruit. What we in the United States incorrectly call "sycamore" is really not a sycamore, but a plane tree.

The various crops of the fig, as well as of the caprifig, are also given different names in different countries. In these pages reference is made to the wild fig as "caprifig," meaning thereby only the male tree of *Ficus carica* L., while the word fig will always refer to the edible fig, or the cultivated race of the same species.

HOME AND DISTRIBUTION OF THE FIG INDUSTRY.

The probable home of the edible fig[1] is in the fertile part of southern Arabia, where at present the caprifig is wild, and where there are no traditions of its introduction. From south Arabia the Bahrâ tribe[2] is said to have brought the fig to ancient Idumaea and to Coelesyria,[3] whence it was carried by other tribes and races to Syria and the Mediterranean shores. The march of the fig was slow and undoubtedly required many centuries to reach the shores of the Mediterranean coast. Once there, the facilities for transportation and the extensive trade and voyages of the maritime nations greatly facilitated its further distribution.

But while it is probable that the home of the edible fig is to be found in Arabia Felix, it is even more likely that the home of the fig industry is to be looked for elsewhere. Nearly all the southern cultivated fruits which we now possess appear to have originated somewhere in western Asia. Almonds, nuts, apricots, peaches, olives, Asiatic grapes, dates, figs, prunes, etc., all seem to have been brought to great perfection in a country somewhere in Asia, but now unknown to us. The bringing to great perfection of so many varieties of fruit indicates a very high state of civilization of very old date, compared to which the Republics of Greece and Rome must be considered modern. Through the very latest archæological discoveries we now know that such a civilization existed as far back as ten thousand years ago in western Asia, in the valleys of the Euphrates and Tigris. Nowhere else have archæologists been able to trace such an ancient and remarkable civilization; and, as the origin of so many of our best fruits, vegetables, cereals, and domestic animals point to a west-Asiatic origin, it is not too much to presume that in the most ancient civilization of Nippur dwelt the originators of nearly all those economic vegetables, as well as animal products, on which man, in all temperate regions, is now dependent for his sustenance.

From the motherland, Asia, the fig was carried over the Western World by two different peoples and by two distinct routes. These two peoples, in ancient times the great colonizers of the world, were the Phœnicians and the Greeks, and to both of these may be traced the spreading of the culture of the fig. The older colonizer of the two was the Phœnician. At the end of the fourteenth century[4] before Christ these thrifty merchants had finished the colonization of the great islands of the Mediterranean, their colonies and trading posts being by that time securely planted on Cyprus, Rhodes, Sicily, Malta, and Corsica. The further course of their trading and colonization enterprise lay along the southern shores of the Mediterranean over the coast of Africa, while on the opposite side of the great sea it stretched along the shores of France and Spain[1] and through the Pillars of Hercules, along the coast of Portugal, and as far north as to the Channel, with its islands and comparatively favorable climate. There can be no doubt that to all these places the fig tree was carried in many varieties at a very early date, even previous to the introduction of the fig into Greece and Italy proper.

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[1] Solms-Laubach (2), pp. 77–78.

[2] Lagarde, 3 c., p. 383.

[3] Ibid., p. 377.

[4] Dunker, 74, c. v, p. 39.

The real history of the fig industry begins after the introduction of the fig into the Mediterranean region outside of Asia, and particularly into Greece. Historical references are few and far between. The tree and its fruit constituted at first merely a luxury for the rich. Later, mention of the fig becomes frequent, and not merely as a luxury during the ripening period, but as an important article of diet for the people during the winter months.

The time of the first introduction of the fig into Europe is very uncertain. In the Homeric songs, the oldest European literature extant, the fig is hardly mentioned. In the Iliad, describing the Trojan war, the greatest national undertaking of the Greeks, no reference to the fig is found. In the Odyssey, describing the wanderings of Odysseus after this war, the fig is mentioned three times. In the part descriptive of the agonies of Tantalus in the lower world we read how in vain he tried to reach the fruits almost within his grasp, "pomegranates, pears, apples, sweet figs, and dark olives."[2] The composition of the Homeric songs is generally conceded to have been accomplished before the ninth century before Christ, but later investigations make it probable that the verses mentioning the fig in the Odyssey are interpolations of much later date. Hesiod, who lived in the ninth century and after Homer, has nothing to say about the fig. The earliest mention of undoubted genuineness is by the poet Archilochus, who lived about seven hundred years before our era. He tells about the fig being cultivated on the Greek island of Paros, and there greatly contributing to the enjoyment of life. The introduction of the fig in Greece must, therefore, have occurred some time in the eighth century before Christ, and undoubtedly it then came from the Semitic nations across from Palestine and Asia Minor. Later on Attika and Sikyon, the latter place named after "syke" (fig), had become famous for their excellent figs, the origin of which was attributed to the goddess Ceres (Demeter), who caused the fig tree to spring up at Phykalos as a reward for the hospitality extended to her by the inhabitants of the place.

The cultivation of the fig soon extended all over Greece, and the fig gradually became an important article of diet of both poor and rich. The Athenians were especially chided for their fondness for figs, and nicknamed "sykophants" (fig-eaters), a name afterwards applied with a different meaning to those spies who informed the authorities about the unlawful exportation of figs from Attika. So famous became the figs of that province that Xerxes, the King of the Persians, daily procured Attic figs for his table in order that they might constantly remind him of the desirability of adding to his domain a country which could produce such fine fruit.[1] From this time the fig is constantly referred to in the Greek literature, and Theophrastus, Aristotle, and other writers describe the caprification process, then extensively practiced.

---

[1] Mooers, vol. II. 512, and Meltzer, I, p. 37. Gades, the present Cadiz, founded earlier than 1100 before Christ.

[2] Od., η. 115, 116; λ. 589; η. 120–121; ω. 339–340; ω. 245.

From Greece the fig tree and its culture spread along the northern shores of the Mediterranean and the Adriatic until it gradually reached the southern parts of Italy. There it must have been established at an early date, as it figures in the earliest Roman mythology, the she-wolf having nursed the infants, Romulus and Remus, under the spreading crown of a certain fig tree, which was thought to be in existence and pointed out as a sacred object in the time of Pliny. Certain it is that from remotest times fig culture was a cherished pursuit among the Romans, who, through seedlings and culture, originated numerous varieties. So different and characteristic had these become in the time of Pliny (23–79 A. D.) that they excited the special attention of that great naturalist. He wrote: "We see from this how the universal law which preserves the types of the species may vary"—a most remarkable expression, which clearly foreshadows the modern theory of evolution.[2]

The many varieties described by the ancient writers, such as Theophrastus, Cato, and Pliny, can not now be identified with any certainty. Many of these varieties originated from seed, some accidentally, others as the result of efforts made for that purpose.[3] Their identification has been attempted by several modern investigators, such as Porta, Gasparrini, and Gallesio, and while their efforts have been highly interesting, they have brought no conclusive results. When we consider how quickly varieties are discarded for others of greater value, it becomes probable that most of these ancient figs became extinct centuries ago. From the many varieties mentioned by the Greek and Latin authors[4] we may, however, conclude that fig culture was extensively distributed and considered of great importance. But notwithstanding the many varieties, the best and choicest figs were those imported from Syria, as we are told that during the reign of the Emperor Tiberius (B. C. 42–A. D. 37)[5] considerable trade existed in

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[1] Willkomm, pp. 6, 9.

[2] Ibid., p. 7.

[3] Varro, lib. 12, cap. XI, 5.

[4] Theophrast, cap. III, 6; V., 2, 8; Cato, vol. I, cap. 8, 1; Pliny, lib. XV, cap. 19.

[5] Willkomm, p. 7.

Syrian figs, these figs being generally valued higher than those of Italy and other Mediterranean districts.

At the end of the Roman Empire, near the close of the fifth century A. D., the fig may be considered as distributed along the coast of the Atlantic as well as along the shores of the Mediterranean. Toward the south the coast of Africa abounded in fig trees, while on the other side fig culture stretched over the wild coast region of Portugal, France, the Channel islands, and perhaps over the southern part of England. But nowhere else had the cultivation and the drying of figs reached such a height of development as in Syria.

Nearly seventeen hundred years after the Phœnician colonization the Arabic conquest began to follow that same route. The Arabs in their turn carried with them the fig tree, now developed into many new varieties, and raised fig culture to a degree of importance which it has never since attained outside of its old home, Syria. The Arabic invasion extended through northern Africa to Spain and Portugal, and in these countries fig culture began to flourish and rapidly became of even greater importance than in Italy and Greece. The Arabs held the fig in the highest esteem and considered it superior to any other fruit. It is even related by Zamakhschari,[1] an Arabian commentator on the Koran, that Mohammed, the prophet, himself, in his enthusiastic enjoyment of the delicious figs, once exclaimed: "If I should wish a fruit brought to Paradise it would certainly be the fig." The Arabic invasion, during the medieval ages, has indelibly stamped its mark on fig culture in the territory it occupied, and to this day the varieties of figs grown there are to a great extent different from and superior to those grown in countries colonized by the Greeks and Romans. Thus Portugal, the most southern province of Greece outside of the Pillars of Hercules, became especially famous for its figs. Algarve, with an almost perfect climate, produced a most superior article of dried figs, the commerce in which became of the greatest importance. Algarve almost exclusively supplied western Europe with dried figs for over one thousand years, and until late in the present century Portuguese figs dominated the English markets. It is only comparatively of recent date that the Smyrna figs have supplanted all others in English and American markets. Even as regards names, Arabic fig culture has left its influence to this day in the various countries of the ancient Arabic caliphate. Thus in Portugal the caprifig is known as "fico de toca," the Arabic name being "tokkar," while in Malta the name "tokar" is yet in use and almost unchanged.[2]

If we again turn to the extreme Orient we find that the fig tree traveled much more slowly toward the east than toward the west. In the time of Herodotus, when all Greece had for centuries enjoyed the fig, and where it had long since become a necessity and an important article of diet, the fig tree and its culture had not yet reached Babylon, and neither Media nor Persia was acquainted with its use. According to Herodotus, Sandanis warned Kroisos not to make war with "barbarians who knew neither wine nor figs."[1] Still, wild varieties of figs, not very different from the caprifig, are found in Persia and India, from which another race of edible figs might have been originated by any intelligent agricultural race.[2]

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[1] O. Celsius, c. II, 371, according to Solms-Laubach p. 82.

[2] Solms-Laubach, p. 83.

Gradually the fig tree spread over Asia Minor and Syria to parts of Mesopotamia and Persia and to the several oases in the great Arabian desert. In the lowlands between the Euphrates and the Tigris fig culture was yet unknown.[2] In the mountain districts of Taurus, Armenia, and in the Iranian table-lands fig culture long ago reached a high development. Toward the east it has spread to Khorassan, Herat, and Afghanistan, as well as to Meru and to Chiwi. But India did not possess fig culture in the fourteenth century, though native figs of good quality and resembling our edible fig are growing wild in the hills of the Punjab.[3]

The fig is supposed to have reached China during the reign of the Emperor Tschang-Kien, who fitted out an expedition to Turan in the year 127 A. D. The fig is first mentioned by Chinese writers in the eighth century. Hia-tscheng-Shi, in his work, "Yu-yang-tsa-tsu," treating of the Chinese trade, speaks of a fruit as "tin-tin" in a country—"Fo-tin" (Palestine). "Tin" is the Arabic name for the fig. This writer mentions that the fruit originated without a blossom, etc. This early introduction of the fig to China may, however, be only a myth. It seems that in the fourteenth century figs were growing in China, but it is not certain if these figs were identical with our own. In 1550, however, the fig is described by the celebrated Chinese writer, Le-Shi-tschen,[4] as growing in Chinese gardens, and from that time we may conclude that fig culture was properly established in the extreme eastern part of Asia. Now many varieties of figs are cultivated in China, some being of very good quality. In Egypt fig culture never assumed any prominent place, undoubtedly on account of the climate, which permits no plants to grow without irrigation, which, if given in any excess, is especially injurious to the quality of the figs. In the old tombs at Benihassan may be seen a wall painting illustrative of a fig harvest, in which the fig tree is characteristically and unmistakably pictured.[5] The hieroglyphical word for fig was "bak-ou," and Syria was often referred to as a country rich in wine, oil, and bak-ou.[1]

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[1] Herodot, I, cap. 71, according to Hehn.

[2] Solms-Laubach (2), p. 45. From the following pages are taken many of the remarks on the eastern geographical distribution of the fig.

[3] Solms-Laubach (2), p. 80.

[4] The Chinese history of the fig is according to letters and manuscripts of Dr. Bretschneider in Peking, to Solms-Laubach.

[5] Unger, pp. 83, 110.

With the discovery of the New World the edible fig obtained a foothold in all the countries visited by the Spanish and Portuguese missionaries. Figs of different and distinct species were found by them growing in the tropical parts of Mexico, Central America, and South America, but these native figs were inferior to those brought over the Atlantic. It is to these Spanish missionaries that we owe the introduction of figs into California, and the "Mission" black fig is yet the most important and most widely distributed variety in all American countries Christianized by missionaries from Spain. This "Mission" fig is extensively distributed over the northern parts of Mexico as well as over Baja and Alta California, Peru, and Chile, while a smaller and slightly different variety is found in the highlands of Mexico and Central America.

To the Southern States of the United States the fig was brought principally by the French in the earliest days of their occupation, while later many varieties were imported from English nurseries. Of late years California has been the great distributing point of fig trees, some enterprising growers having made many direct importations of varieties from the Mediterranean districts, and these varieties have since found their way to Florida and other States.

It is interesting to note that while California has progressed enormously in fig culture and now possesses over a hundred varieties of figs imported from various parts of the world, its neighboring States, Sonora and Baja California, which are so preeminently suited to fig culture, are yet ignorant of the existence of other figs than the "Mission."

BOTANY OF THE FIG.

"Genus," "species," and "variety" are words used frequently in these pages, and must be thoroughly understood by anyone who wishes to master the principles of horticulture. In order to properly name, know, and classify plants they have been primarily arranged and grouped together according to their relationships and similarity. Thus all roses, wild and cultivated, are grouped and called by a common name—*Rosa*. This, then, is a genus, and the word *Rosa* is called a genus name. Similarly all figs, wild and otherwise, which resemble one another in certain respects are grouped together under a general genus called *Ficus*. There are a great many different kinds, originally wild, of roses and figs. Each one of these is called a species and is given a separate name. Such as the dogrose is known as *Rosa canina* and the edible fig is known as *Ficus carica*. There are many different edible figs, and these are called varieties or forms.

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[1] Chabas, p. 105.

Those varieties which differ very much in more important points might also be classified as species.

Many genera which resemble each other in several important points are grouped in a large group called a "family." Thus the genus *Rosa*, together with other genera, are grouped in the general family *Rosaceæ*. The fig and mulberry are placed in the same family, to which is given the Latin name *Moreæ*.

STRUCTURE OF A COMMON FLOWER.

As repeated references are made to the various parts of a fig flower, a short description of the structure of a flower is given.

By a flower is designated that particular part of a plant which produces the pollen and the seed, and its various parts are especially adapted for both the production of pollen and seed as well as for the protection and benefit of the generative organs producing them. In order that seed may be generated the flower possesses two distinct parts, which have different functions in the process of generation. These parts are known as male and female, and both of them must be present in order that seed may be produced.

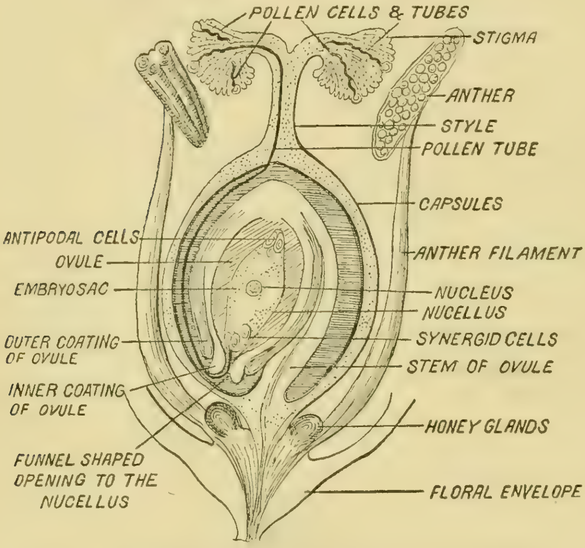


FIG. 1.—A diagrammatic representation of a common flower.

These parts may either be found both in the same flower or one kind may be found in one flower, the other kind in another flower, or the two kinds may be found on two individual trees. In other words, we have flowers which contain both male and female organs, and we have flowers which are either male or female; or we have trees and plants of which different individuals carry either male or female flowers only. The female organ of a flower is called pistil; the male organ is known as stamen. The stamens are generally present in large number and situated in a ring around the ovary, which is found generally in the center of the flower. Surrounding both these organs are one or more rows of petals and sepals, known by a common name—perianth or floral envelope—but popularly though wrongly called "leaves." This perianth serves as a protection to the seed and pollen producing parts, and when colored also serves to attract insects, without the aid of which comparatively few varieties of flowers would produce fertile seed.

The accompanying illustration (fig. 1) represents a flower which has been cut through lengthwise in order to show the generative organs, the petals having been left out. The cut does not represent any certain flower, but a flower in general.

The male organs are represented by two stamens. These consist of an upper button-like part, the anther, which produces the pollen, and a lower stock or outer filament, which supports the anther. The right-hand anther shows on its surface the pollen grains.

The female organ of the flower consists of an ovary and an upper part, the stigma, supported by a style. The ovary contains the ovules, each of which has two coats surrounding the central nucellus. This is the part which directly produces the future seed. The stigma is the uppermost part of the female organ. It is generally kept moist by a special gum-like fluid, which causes the grains to adhere to the stigma. The stem supporting the stigma is called the "style." Through the center of the style down to the funnel-shaped opening in the ovule there runs a hollow canal, which gives admission to the nucellus.

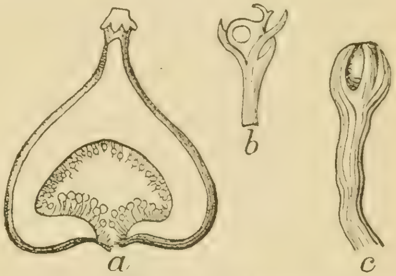


FIG. 2.—A seedling fig and fig flowers. *a*. The fig cut in half, showing the male flowers surrounding the eye-zone and the gall flowers at the bottom of the fig receptacle; *b*. a gall flower; *c*, a degenerate male flower. Grown by E. W. Maslin.

In order that a flower may produce seed it is necessary that the pollen tubes produced by the pollen should penetrate through the stigma and style into the ovary. This process is called fecundation. The pollen grain and the cell of the ovule unite, and from their union the seed and the new plant are formed.

CHAPTER II.

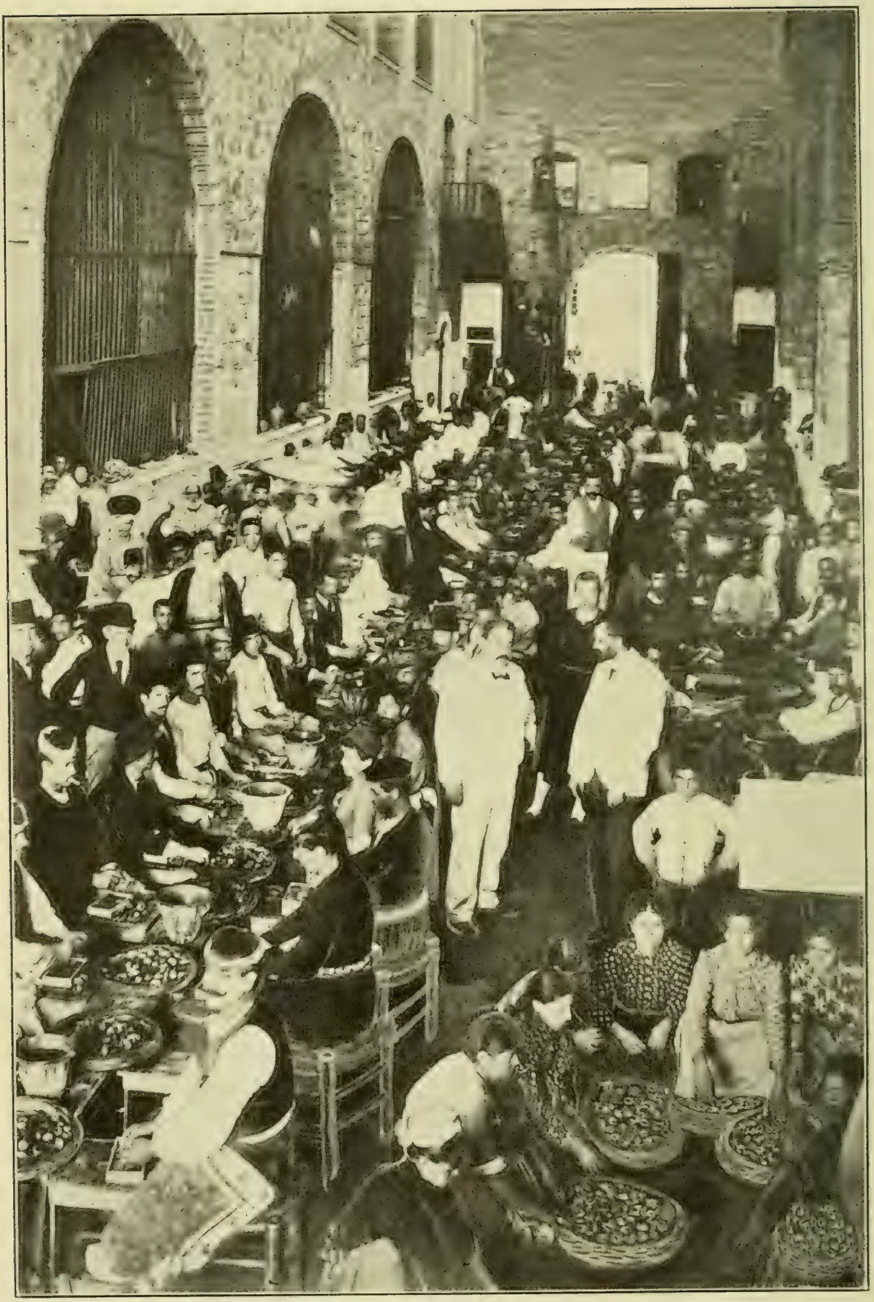
FIG CULTURE IN VARIOUS FOREIGN COUNTRIES.

FIG CULTURE IN SMYRNA AND ASIA MINOR.

The best and most delicious figs when dried are those from Smyrna, known in the market as Smyrna figs. They derive their name from the seaport Smyrna, where they are packed and whence they are shipped to almost every country on the globe. The figs are, however, not grown in or very near to Smyrna, but in various places about 80 to 150 miles south and east from that town. Smyrna is to-day one of the most prosperous towns on the Mediterranean shore and one of the most important in Asia Minor. This prosperity is due to the trade in fruit, principally raisins and olives. The fig trade is smaller, but so excellent is the fruit that this product more than any other has made the port known all over the civilized world, and apparently the more so the farther we go west. In California, more than elsewhere, the name of Smyrna has become a household word to the horticulturists, who have been trying for years to produce figs equal to those shipped from Smyrna.

As is well known, Smyrna is situated in the western part of Asia Minor, and at the eastern end of the large and well-protected bay known as the Gulf of Smyrna. The latitude is 38°, corresponding approximately to that of San Francisco, but the climatic conditions of the places where the figs are grown correspond more properly to those of central and southern California, northern Sonora, southern Texas, etc.

In the most ancient times of which we have record a considerable fig trade existed in Smyrna, and we are told that in the time of the earlier emperors of Rome, in the first century of our era, dried figs of the best quality were brought from Smyrna to Rome. This fame for excellent figs was enjoyed by Smyrna all through the Middle Ages and down to our own times. At the time of Henry VIII and Elizabeth Smyrna figs reached England. It is, however, at a comparatively late date that the Smyrna fig trade reached the development it now possesses. The great competitors with Smyrna figs were those grown in Algarve in Portugal and for centuries known as Pharo figs. These were for a time the most common figs in the European market and were almost the only ones consumed. In the beginning of this century, however, the Portuguese or Pharo figs began to deteriorate, while at the same time, principally through Greek influences, a marked



INTERIOR OF A SMYRNA PACKING ESTABLISHMENT.

Photograph by Paddock & Fowler Company.

improvement was noticed in the packing and curing of the Smyrna figs. To-day the Pharo figs are almost unknown, while the Smyrna figs have not only secured control of the former markets of the Pharo figs, but greatly extended them. (Pl. I.)

FIG DISTRICTS.

As already stated, while Smyrna is the export and packing place for the figs bearing that name, they are not grown in the immediate vicinity of the port, but are cultivated farther inland and to the south, in the valley of the Meander River. The river basin, which runs due east and west, lies about 80 miles south of Smyrna, from the vicinity of which it is separated by the Salatin Mountains—a rather high chain also running east and west. The principal fig district thus faces the south, being sheltered by the mountains from the north. The Meander Valley, situated principally on the north side of the river, is about 50 miles long by not over 5 miles wide, and generally less. But the fig district has of late extended even farther north, and the first orchards which are reached in going from Smyrna are situated on the north side of the Salatin Mountains, in the foothills of Ayasalouk, close to the ancient Ephesus. After the summit of the foothills has been reached at Azizieh, the road rapidly descends, and at Balachica the western point of the main fig district is reached. From here it extends about 50 miles due west into the interior. The most famous part, where the finest figs are grown, is the vicinity of Euovassi, at an elevation of 210 feet above the sea. Between Aidin (pronounced *I*-deen) and Nashi the land rises from 217 to 260 feet, and from there to the upper end of the valley there is a rise in all of 600 feet. The valley of the Meander, now traversed by a railroad, consists of a rather level plain, crossed by a number of gulches. The soil is very deep and rich, consisting of a vegetable loam, rich in mica and humus, possessing to a very high degree the quality of retaining moisture, so necessary to the well-being of the fig trees. No irrigation is resorted to or as a rule required.

According to the localities where grown, the Smyrna figs are divided into several different grades. Thus, proceeding from east to west on the Aidin railroad are found first the "Nazly figs." These are grown between Ortoxi and Nazilli or Nasly. Those grown between Aidin and Erbeghly are known as "Erbelli" figs, and those coming from points farther west from Dermendjik to Forbaly are known as "Forbaly." Another smaller fig district, about 5 or 6 miles in diameter, is situated at Demieh, about 50 miles southeast of Smyrna, on the north side of the Salatin Mountains, in the valley of the river Kaistros.

CLIMATE AND SOIL.

The climate of the Aidin Valley differs somewhat from that of Smyrna, being warmer and drier. Thus, while Smyrna and its vicinity are admirably suited for the growing and curing of raisin grapes, especially the Sultanas, Rosaki, and Black, the interior is less suited to them, but more to figs and oranges. The maximum heat in the summer seldom rises above 90° F. in the shade or 130° F. in the sun, and in the winter rarely falls below 30° F. There is considerable dew throughout the season, even in the summer, and the air is much more moist than in California and Arizona.

The winter is the rainy season, the summer the dry one, as on the Pacific coast. The rain falls from November to April, beginning and ending with scattering showers. The average rainfall is about 25 inches. From April to November practically no rain falls. While there is but little frost in the winter, there are sometimes frosts in March heavy enough to cause much injury to the young caprifig, the lobfigs not having set.

VARIETIES OF FIGS.

Regarding the names of the figs grown in the fig districts much confusion prevails, as the figs are known by the places where grown, or designated by color, shape, etc., or by quality, or style of packing. Thus "Leker ingir" means simply layer figs. The Turks, unable to pronounce "layer" properly, the name given by the English merchants, have corrupted it to "leker." Leker ingir is, therefore, not a variety, but a style of fig packing. "Hordas" are white figs of inferior quality which require no caprification. They are dried and shipped to Austria and Germany for adulterating coffee and for distilling. The white Hordas are used for the coffee, while the brown Hordas go to the distillery. "Budrun Hordas" is a variety which when dried is preferred by makers of adulterated coffee.

The following are some of the most generally cultivated figs in the Smyrna districts:

Lob Ingir (*lob meaning juicy, and ingir fig*).—This is the best fig for drying. The pulp is white; the form flat; the stalk short; the ribs prominent before maturity; the eye rather large, not open; skin whitish yellow; leaves deeply lobed, with the lobes long and narrow pointed. Of the five to seven lobes some are larger than others, making the leaf rather lopsided. Lob Ingir is undoubtedly identical with the variety known as "Bulletin No. 1,"[1] now grown in many places in California, where, however, it does not produce any crop without caprification or pollination, though now and then a fig of the first crop comes to partial maturity.

Ak Ingir (*ak, white; ingir, fig*).—Another fig for drying, possibly identical with "Bulletin No. 3." Fruit has not yet matured in California. Judging from unripe specimens, the fig is very round; the eye prominent; the leaves almost entire, with very heavy white veins on the back.

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[1] Varieties of figs introduced by the San Francisco Bulletin several years ago; hence the name.

Chil Ingir (*chil, smallpox; ingir, fig*).—This is a white fig of fine drying properties, covered, when fresh, with green spots as large as a dime or less. When drying, this fig becomes white and the green spots turn even whiter than the rest of the skin.

Hazir Lop (*hazir, ready; lop, to swallow or bite; also juicy*).—White; large; characterized by the stem remaining on the tree when the fig is pulled; very fine for eating fresh; not used for drying; requires caprification.

Sarilob Ingir (*sarilob, yellow; ingir, fig*).—This is another of the Smyrna figs. Perhaps it is identical with "Bulletin No. 2." In such case the fig is oblong, pyriform, broadest above the apex; the stalk is short; the skin yellow and slightly downy; the pulp pink; the leaves rather entire, with three shallow lobes; the eye large, protruding; requires caprification to mature fruit.

Bardakjik (*from bardak, an Egyptian pitcher*).—One of the very best drying figs. It is possible that this fig is among the "Bulletin" importations to California, but if so it has not yet been among those pollinated by the writer. This is a longer fig, having a white skin of extreme thinness, and an amber pulp. It dries well. It is often eaten fresh, and as such is considered the finest eating fig known.

The caprifig, which is grown for caprification, and which also grows wild in the hills, is known as "ilek," and the process of caprification is known as "ilek atmak."

Other fruits which grow in the fig region are oranges, olives, and rosaki and black grapes. No wine is made in the fig region. Raisins are produced to a limited extent only. Apricots and peaches are grown in moderate quantity, but only for home use.

PLANTING LOBFIGS.

Before planting the ground is well and deeply plowed several times, fertilized with camel manure, and freed from weeds.

The planting is frequently done in a peculiar way not found in use outside of Smyrna. It is generally done in March. Of late the trees are grown about 60 feet apart in regular rows, though the older orchards were planted closer and more irregularly. The holes are dug of good depth, and for every hole two cuttings are used, which are set crossing each other. The butt ends are from 9 to 12 inches apart both below and above the soil, the cuttings thus crossing each other in the middle of the hole. The latter is filled up and stamped tight, leaving the cuttings protruding about 2 inches, which projecting part is again covered with loose soil, forming a small mound, in order to prevent drying out by wind and sun. During the first season hand watering is resorted to if the winter be a very dry one. Afterwards no irrigation is used or required. This peculiar way of planting, which has been considered an heirloom of ancient superstition, has been much condemned; but the custom is nevertheless a most excellent one, as it causes the fig tree to branch and spread in a number of fan-shaped branches, which prevents the very dangerous breaking of the limbs and branches of the trees. If we wish to prevent the breaking down of our own fig trees we must adopt this very method. Trees grown in this manner branch close to the soil and spread out in all directions, forming a number of trunks or stems. Only enough of the lower branches are cut away to allow passage for the pickers, and so low are the branches allowed to remain that the pickers must bend in order not to strike them, the lowest branches being 3 to 4 feet from the ground.

This planting also causes the trees to be more open to air and allows more sunshine in the interior of the crown. The advantage of this is evident when it is remembered that the best lobfigs are always found on the outside of the tree and never among the interior branches, where they are shaded and never come to proper maturity. The contrary is the case with the caprifigs, the best for caprification being found in the interior, among the denser foliage. The pruning of the fig is not extensively practiced in Smyrna. Trees planted as just described produce no main standard or central trunk which later needs to be cut out, but only several branches, which bend away from one another in a goblet-shaped manner. The necessary pruning is therefore confined to the cutting away of limbs that cross one another, and also to the cutting away of some of the year's growth from where it starts out from 3 or 4 year old wood. Limbs are never cut square off.

An important part of fig cultivation in Smyrna is the watching of the orchards. This is done by special guardians or watchers, known as "beckji." They stay in the orchards day and night, in specially prepared arbors or camps under some large tree near the drying ground, and their business is to keep away all intruders—thieves of humankind as well as beasts and birds.

The bearing quality of the fig depends greatly on the age of the fig trees. Younger trees will produce 50 pounds of dried fruit, trees in good condition bearing 150 pounds, while old trees will yield 300 or more pounds of dried fruit. No fig tree of the drying kinds is supposed to produce figs suitable for drying until it is four or more years old.

CAPRIFICATION.

Caprification, or "ilek atmak," is practiced yearly, as without it the crop will fail to set and mature. The time for this operation is in the last week of June. The figs have then reached the size of a hazelnut or larger. Four or six caprifigs are strung on a reed, and this is thrown over the branches of the edible fig trees. Later, as more figs appear on the edible fig trees, the process is repeated, as the issuing of the wasps will cease in a few days. To a small tree only a few strings are required, while for a larger tree about 30 strings are needed to insure pollination. In case the caprifig crop fails, boat loads of caprifigs are imported from the Grecian islands at a great expense. In great scarcity the caprifigs sell at from 2½ to 4 cents apiece, which shows the value placed on them by the cultivator.

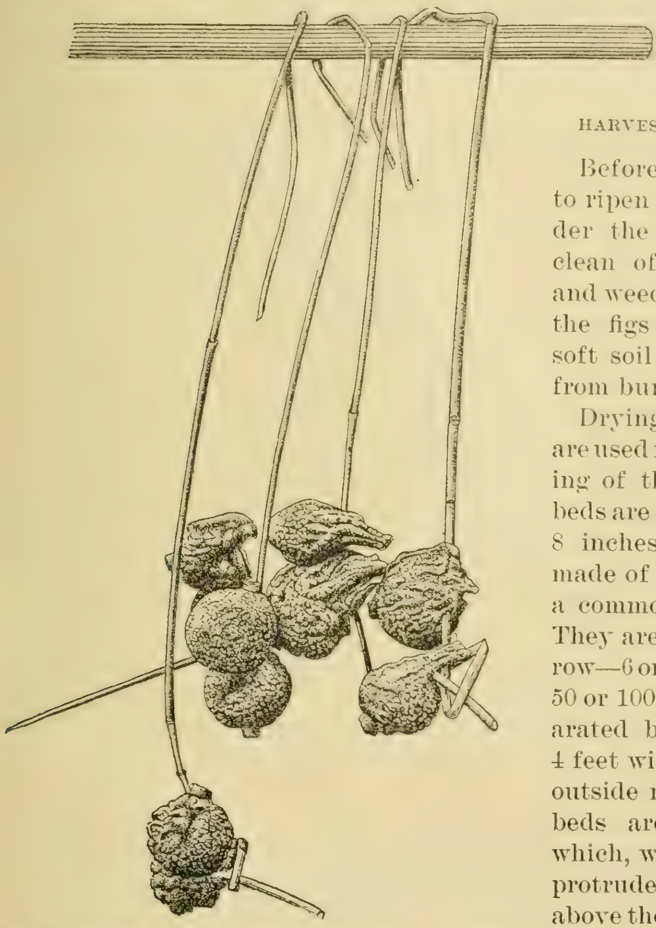


Fig. 3.—Caprifigs used for caprification, strung on Esparto grass, as used in Sicily. The figs have become dried and the wasps have escaped. (Photograph by N. B. Pierce.)

HARVEST AND DRYING.

Before the figs begin to ripen the ground under the trees is raked clean of leaves, clods, and weeds, in order that the figs may drop on soft soil without injury from bursting.

Drying floors or beds are used for the final drying of the figs. These beds are low—about 6 or 8 inches high—simply made of loose soil, like a common garden bed. They are long and narrow—6 or 8 feet wide and 50 or 100 feet long—separated by walks about 4 feet wide. Along the outside margin of these beds are driven pegs which, when in the soil, protrude but slightly above the bed. Between these pegs willow or other thin branches or arundo canes are braided, in order to protect the bed and prevent the soil from falling out on the walks. The tops of the beds are first stamped hard and wetted, then covered with mats made of rushes or esparto grass or of the split canes of the Italian cane (*Arundo donax*). On these mats the figs are dried. Many of the poorer growers cover the beds with the split arundo canes.

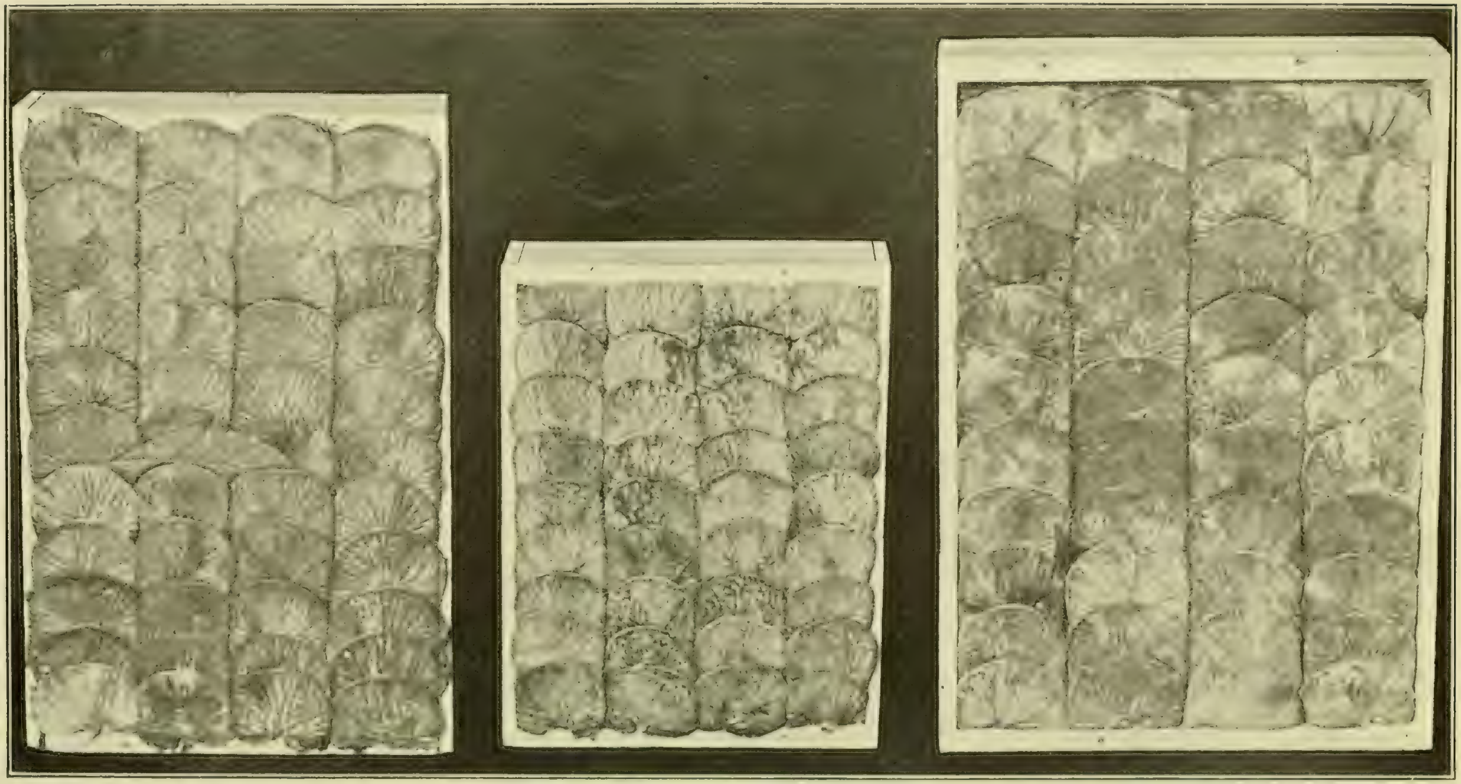
At the end of July the figs begin to mature. The fig is never cut from the tree, but falls of its own accord when partially cured or overripe. At first the figs drop a few at a time, and but few laborers are required, the picker having to glean all over the ground in order to fill a basket. In August, however, the figs fall thick and fast, and the whole laboring population is required to pick and dry the crop.

The figs are never picked up while covered with dew, but only when perfectly dry. The most favorable time for picking is during the blowing of the north wind, as the figs then dry better and assume a better color. The figs are picked up into wicker baskets and immediately conveyed to the drying ground near by, where they are carefully spread out singly, none being allowed to overlap another, in order that they may receive the necessary sun and heat.

After three to four days of exposure those figs which are dried sufficiently are taken up, divided roughly into three different grades, and care taken that they do not dry too much. The skin must feel dry, but the inside must be soft. The very choicest figs are conveyed to Smyrna in baskets. The general grade, or "eleme," is dumped in sacks made of goat hair and camel's hair, while for the third or poorer grade or "horda" common, yellow-colored sacks are used. The goat-hair sacks are very durable, and do not become so sticky from any exuding juice. They are also impervious to dust. These bags are also very expensive, and, indeed, are very seldom owned by the growers, but hired from the "devegees," or camel men, who carry the figs to the railroads and to Aidin. These devegees are in reality contractors who haul the crop away, ship it on the railroads, accompany it to Aidin, and finally dispose of the figs to the traders there. They constitute a real corporation of middlemen, known for their honesty and capability. Their work for the season ends only with turning the sum received for the sale over to the grower. The guild of the devegees is an important one in Smyrna. The compensation of the devegee is 7 per cent of the sale.

PACKING.

The fig grower in Smyrna does not pack his own figs. The packing is done by special firms who employ skilled labor. The packing consists of two distinct operations—the assorting and the packing proper. The assorting is done by comparatively unskilled labor, women being always employed for this part of the work. The figs are dumped from their hair sacks on mats spread directly on the floor, and girls and women squat down around the piles. Each woman has in front of her at least three baskets, into which she assorts the fruit, in three grades, while the refuse remains on the floor to be packed in 50-pound bags, which are disposed of for home use or shipped to England and France for distilling, etc. The grade is determined by size, color, thinness of skin, etc., and is judged by both eye and hand.



THREE BOXES OF LAYER FIGS FROM SMYRNA.

The 5-pound box contains 4 rows of 9 figs each, and 5 layers in depth; inside measurements of box are as follows: 2⅛ by 7⅛ by 9¾ inches. The 8-pound box contains 4 rows of 11 figs each, and 5 layers in depth; inside measurements of box are 2½ by 8¼ by 12¾ inches. The 12-pound box contains 4 rows of 10 figs each, and 5 layers in depth; inside measurements are 2½ by 9¾ by 13¾ inches. Photograph by Paddock & Fowler Company.

These assorted figs are carried away by men to the packing rooms and are now known as "maccaronia." The packing proper is done by men in separate rooms and on rough tables. This process consists of two operations—pulling and splitting, and packing. Each packer has in front of him a jar with salt water for moistening the hands, which are always kept wet in order that the figs may not stick. Next the figs which are packed as "eleme" are pulled and drawn between the fingers and thumb into a flat dish-like form and then the back part is split, which allows still more spreading of the fig. In pulling the fig the "eye" part is brought into the center of the disk, which gives to the other part a handsome appearance, the coarse and thick part of the fig being centered around the eye. All the best figs are packed in boxes containing from 2½ to 50 pounds. They are placed in regular rows, without any guide, and so skillfully is this done that the lines between the rows are perfectly straight and even to such a degree that a sheet of paper may be dropped between them. The rows all consist of layers, one on the top of the other, all through the box. When finally the box is filled it is passed out to women, who place laurel leaves between the figs of the top layer, after which the carpenters nail the boxes and trim them off. (Pl. II.)

Another and better mode of packing is employed with so-called locoum figs. These are not pulled and split, but pressed between the fingers until they become almost square, and are then packed closely together. In all this packing no presses are used. The "eleme" boxes are simply piled upon the floor, one on the top of the other, which presses them sufficiently. The poorer grades are packed in barrels in concentric rows. When such a barrel is full a loose bottom is put in and the packer gets in and tamps it down in order to compress the figs solidly. By the middle of October the packing is generally over and the packing establishments are closed for the year. In some of these large packing houses as many as 500 hands are employed; 150 of these are women, 50 boys and girls, and 300 men.

BRANDS AND BOXES.

There are two great brands of Smyrna figs—the "eleme" and the "locoum." The former are always packed flattened out, the latter like little cubes. The word "eleme" means "select," or better, the "cream," as it were, skimmed out of a lot of common figs. Through habit this brand of fig is always first pulled, flattened, split, and pressed, and on this account it has been repeatedly stated that "eleme" means "pulled," which, however, is not the true meaning of the word.

Locoum indicates a square cube of so-called fig paste, a kind of sweetmeat made of sugar and starch and a little coloring matter, without any particle of fig in it. This very stuff is also sold in many American cities under various names, as sugar figs, fig paste, etc. It generally comes as a square sack, or cube, probably originally intended to imitate the fig. The Turkish name for this paste is "Locoum," and the brand "Locoum" on the box containing real figs indicates the manner of packing, in imitation of the Locoum pastes. The fig can not be worked in the shape of "Locoum" unless it is unusually thick and meaty, and therefore the best figs are always selected for that style of packing. The figs branded "Erbelli" come from the country surrounding the smaller village of Erbeghli, which has the reputation of growing the finest figs. The Erbelli figs are generally packed as "Locoum," and frequently both names appear on a box, indicating that the figs come from Erbeghli and are packed Locoum style. (Pl. III.)

Exporters put all kinds of fancy names on the figs which they send out, and vary them from time to time. Every year sees some novelties as to name, style of packing, package, etc. But two or three firms have adopted regular brands and goods which can be relied on to be uniform and regular one year with another. Messrs. Dutilth & Co., Smyrna packers, have kindly furnished the following information:

The best brands are graded as follows:

Imperials	Imperial Crown.
London layers	Extra ✠ blue (4 crowns).
Choice	Finest ✠ red (3 crowns).
Prime	Fine ✠ black (2 crowns).

These grades go both to England and America, no grade being packed exclusively for England or for America. The only brands which come always in the same manner of packages are those just referred to; all other package-marks vary as regards name, brands, sizes of packages, number of figs in each package, etc., greatly, of course, to the detriment of the trade, but more so to the packers themselves.

The inside measures, in inches, of the fig package of E. J. L. are as follows:

Imperial crown, 12½ by 16½, carrying 5 rows of figs with 11 figs in a row.

Extras differ in size of box, a 9-pound box, measuring 9 by 11½, carrying 4 rows of 8 figs each. Of this grade there are 12, 18, and 5 pound boxes also.

Finest are put up in 8, 10, and 12 pound boxes. The 12-pound box measures 10 by 14 and contains 4 rows of figs each.

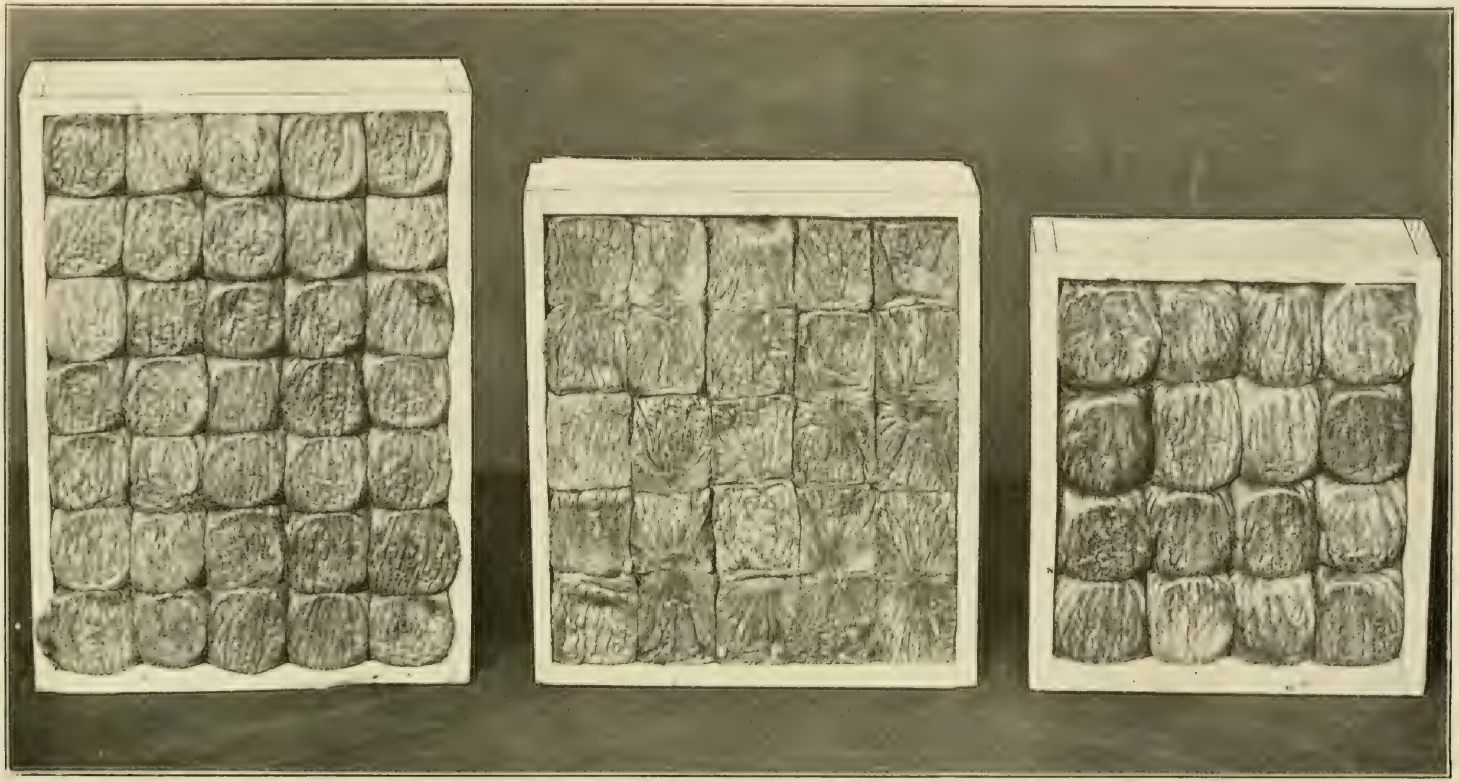
Fine are put up in 10-pound boxes only, measuring 9 by 12, containing 5 rows of figs, with 11 figs in the row.

In these brands one always finds the same size of figs, whether they are in a 12, 10, or 8 pound box of the same grade.

The general run, or what is called the American standard, measures as follows:

	Inches.
12-pound box, 5×11 figs	9.5 by 13
10-pound box, 5×10 figs	8.4 by 12.2
8-pound box, 4×9 figs	7.1 by 11.5
6-pound box, 4×8 figs	7.2 by 9.4

These figs seldom contain the same number of figs in the lower layers as in the upper layers. Thus for the ordinary grade of figs—American standard—it is the general custom to put a smaller fig in the lower rows. Thus a box will have 5 by 11 figs on top, while below them 5 by 13, etc.; but the standard brands always come with the same number of figs all through. The lumber for these boxes all



THREE BOXES OF LOCOUM FIGS.

Center box packed in English style, with square corners; outside boxes are packed in American style, with round corners; two smaller boxes are of same quality, best in the market; largest box is of the second quality. American style of packing is handsomest, but allows air to enter among the figs, causing them to dry quicker. Measurements: The small box contains 2½ pounds, 4 rows of figs, 4 in each row, 3 layers in depth; inside measurements are 2½ by 6 by 7 inches. The middle box contains 4 pounds, 5 rows with 5 figs in the row, and 3 layers in depth; inside measurements are 2½ by 6¼ by 7¼ inches. The largest box contains 5 pounds, 5 rows of 7 figs each, and 3 layers in depth; inside measurements are 2½ by 6¼ by 9¾ inches. Photograph by Paddock & Fowler Company.

comes from Austria. No regular price list is offered from Smyrna. When the figs arrive in this country they are at once placed in the hands of brokers in the United States, who draw samples and sell on sample boxes.

The English trade prefers smaller packages, such as 1, 2, 4, 6, and 8 pounds, while the United States have them almost all running 8, 10, and 12 pounds. A small quantity of 6-pound boxes will sell, but only a very few. A few of 1, 2, and 4 will also sell.

The price of Smyrna figs varies considerably with the season, as well as with the quality. The average price for ten years for the last three grades has been as follows: Per quintal of 112 pounds, $4.08, $8.75, and $19.22, all in the Smyrna market, packed.

As may be judged from the foregoing statements, the peculiarities of the Smyrna fig trade, through which it has attained the height and prosperity it now enjoys, are as follows:

A peculiar class of figs which require caprification. Of these figs there are three principal varieties grown for commerce. A favorable climate—dry, warm, and moderate, both winter and summer; rich soil, which retains moisture and which does not require irrigation; extreme care in selecting, assorting, grading, and packing; established grades, which can be relied upon year after year.

EXPORTATIONS.

The best grades have always been taken by England, Germany and the United States coming next. Of late years, however, the United States has begun to consume much better grades. The production of figs in California is also reducing the importations to the United States. The poorest grades are used in France for distillation and are exported to Austria and eastern Europe generally for distilling, as well as for the adulteration of roasted coffee. The production of figs has greatly increased of late years in Smyrna and its vicinity. In 1870 about 6,000 tons of dried figs were brought to Smyrna for packing from the valleys where they were grown. In 1882 about 10,600 tons were brought in for packing, while about 7,000 tons, valued at about $1,600,000, were exported to France, England, Germany, and the United States. At the present time the production has considerably increased, and probably about 13,000 tons are now packed yearly.

FIG CULTURE IN GREECE.

GENERAL HISTORY.

The history of the fig in ancient times in Greece has already been briefly discussed. Originally the fig was introduced from the Orient at a time somewhat later than the Trojan war, or a little before the eighth century before Christ. The Grecian islands were the first to receive the fig, and the fruit soon spread throughout Greece and became highly appreciated by a people who had for ages partly subsisted on acorns from the native trees. The mythological fables relate how the goddess Demeter visited that country and that one night she was belated and was given a friendly and hospitable reception by Phytalos. In return for the hospitality, she bade the fig tree spring from the ground in the same manner in which Minerva had caused the olive to appear. In time the fig became a sacred tree and second only to the olive in importance. By the time of Theophrast a large number of fig varieties had been originated and imported. These varieties are, however, so indefinitely described that they can not be identified with any now existing, though it is possible that some of them may yet survive. The ancient Greeks knew the caprifig well under the names of Olynthos and Tragos, the latter being the name used by the Messenians. Other names of this tree were Erineos (*Ἐρινεός*) and Sycheagria (*Συχῆαγρια*)—in new Greek Agriosykia (*Αγριοσυκιά*).

The best figs in ancient times were those grown in Attica. They were so highly valued and considered so necessary for home use that a law was passed prohibiting their export. Until this law was promulgated smuggling, it was said, was unknown, but from that time it became a common and profitable business to secretly export and sell figs. To prevent this practice, special guardians were appointed by the Government to watch and accuse those who broke the law. These guardians were called sycophants (from sykon, a fig, and phainein, to show). These officers of the law soon became hated on account of the blackmail used by them for their own enrichment, and the word sycophant became synonymous with the idea of a secret spy. This meaning of the word has survived to this day.

The fig had among the ancient Greeks a sacred, symbolic, and mystic meaning, an emblem of fertility and propagation. The flowers of the fig were hidden, while all other flowers were open to the light of the sun. The fig soon became a religious and mythical symbol in the festivities and worship of the god Dionysios, and a basket of fresh figs was carried next to the vessel containing the wine destined as offering to that god.

FIGS IN MODERN GREECE.

The cultivated and edible fig is known in Greece as "he sykea" (*ἡ συκέα*), and the figs are known as "ta syka" (*τα συκα*). The old Pelasgic name was "fik," plural "fikj," and from this word has originated the modern word "fig," as well as the ancient Latin word "ficus."

In modern times the fig tree is extensively cultivated all over Greece, in the mainland as well as on the islands, and many varieties are cultivated. Among these the very early kinds are known as "proima" (*πρόιμα*). The best and earliest of these come from Ægina, and are ripe in the month of June. Other famous varieties are the so-called Smyrna varieties, or the "Smyrnaia," though we have no means of knowing whether or not they actually are identical with those grown in Smyrna in Asia Minor. Other varieties, bearing only or principally large first-crop figs, are known as "basilika" (*βασιλικά*) or "royals." They are generally dark and used only for the table.

The figs for drying and export come principally from Kalamata, a place also celebrated for its "currant" raisins. The islands of Andros and Syros are also well known for their figs, though they are inferior to those of Kalamata. The crop from the latter place is principally exported to Russia, Austria, and central Europe generally. A few reach France and the United States. The bulk of all these figs is

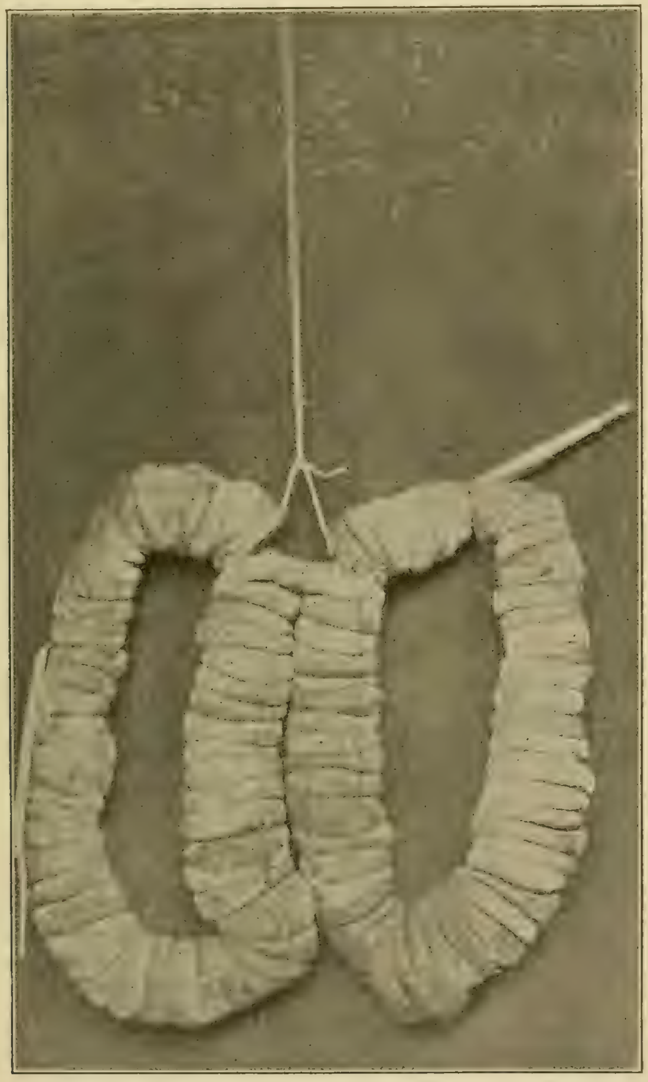


FIG. 4.—String of figs as packed in Greece. (Photograph by Paddock & Fowler Co.)

used for the manufacture of "coffe" and brandy. The figs from Andros are of a dark brown color, owing to the mode of curing and drying in heated ovens. The Kalamata figs, which are now and then found in the United States, are vastly inferior to the imported Smyrna figs and are not even equal to uncaprificated California figs, the quality of which has in late years greatly improved. As regards the cultivation of the trees and the curing of the figs in Greece little of value is to be noted. As the figs are of inferior quality the methods of producing them must also be inferior. The gathering of the figs for drying commences about August 1 to 5. The ripe ones are cut from the tree by a reed split at one end. Only the ripe ones are gathered, the others being allowed to hang until ripe. The cut figs are placed on the ground to dry. In places where more care is taken low beds of soil are covered with straw and stamped hard. The beds are divided in sections 39 inches in width. At each side there is a ditch to receive the occasional rains. On this account the center of the beds is slightly raised in order that the rain may more readily flow off. When the figs have been exposed for about four days they are turned, about eight days being required to finish the drying. The Grecian mode of packing (fig. 4) is a most primitive one, probably actuated by the want of proper material for boxes. The figs are simply strung on reeds to the number of from 50 to several hundred. These strings are then formed into wheels of various shapes and weights and are then packed in larger boxes. Such wheels are not uncommon in the markets of the United States. Most of the Grecian figs are caprificated, as can be readily demonstrated by cutting the figs open and examining the seeds. The latter mostly possess embryo. Only rarely have imported Grecian figs been seen which had not been caprificated. The figs are exported in large quantities from Calames and Andros. The next largest places from which the Greek figs are exported are Caryntie, Tenos, Pylia, etc. The export, which is steadily increasing, now reaches some 30,000,000 pounds annually. The poor quality of the Greek figs is the more remarkable, as the majority of the laborers in the Smyrna packing houses are Greeks.

Caprification, as has been stated, was practiced in Greece in very ancient times. Whether the caprifig was introduced or was indigenous can not now be decided with certainty; but it is probable that the fig and the caprifig were introduced together. It has been stated that during the eighth century before Christ edible figs were growing in Greece, and it is certain that caprification was known at the time. From that time to this caprification has continually been practiced and is an inseparable process in the cultivation of the fig. The wild or caprifigs are called *ὄρινια* or *ὀρινιους*, while in ancient times they were known as *ερῖνεὸς* or *ερινὸς*. The Pelasgic name for the caprifig was "piri." At present the caprifig grows in great abundance in waste places and among rocks all over the country. So common is the caprifig that at times ship loads are exported to Smyrna to serve in caprification when the native caprifigs fail to yield on account of unfavorable seasons. The French botanists, Tournefort and Olivier, who were greatly prejudiced against caprification, tried to prove its worthlessness by the fact that Greek peasants had been seen to suspend oak galls and excrescences of elms and poplars in the fig trees instead of caprifigs. Such foreign substances could naturally have no effect in pollinating the figs, and the figs so practiced on would have set in any case. This observation of the botanists in question shows that in Greece varieties are grown which are similar to those we have in this country and which require no caprification in order to produce figs.

Among the most interesting of the Greek caprifigs is the variety known as Erinosyce. This fig, which bears caprifigs as a first crop, produces a second crop of edible figs. A somewhat similar fig has been found in Brittany and lately also in California.

FIGS IN NORTHERN AFRICA.

EGYPT AND KABYLIA.

Figs have been grown in Egypt since very ancient times, but still that country cuts a comparatively small figure in the fig market of the world. Though some 2,000,000 pounds of dried figs are exported every year, they are of inferior quality and are used principally for the production of spirits and the adulteration of coffee or the manufacture of imitation "coffe." A much more important fig district than Egypt is found in Kabylia. This district, which is a part of Algeria, is situated east of the city of Algiers and extends from Dellys to Bougie. The principal town in this district, Tizi Ouzou, is surrounded by the largest fig district in the world outside of Smyrna. Not only are figs exported in large quantities, but the whole native population subsists on figs for many months in the year. The following account of the fig industry in the district is mainly from Hanoteau and Letourneux:

Fig culture in Kabylia.

Localities.—The fig flourishes everywhere and is found not only in the lower levels, but to an altitude of over 3,000 feet. In the vicinity of Aït Ouâban it reaches to the zone of the cedars.

Varieties.—The Kabyles distinguish some twenty-eight varieties of edible figs, besides a number of caprifigs used exclusively for caprification. Of the latter there are four distinct kinds. The edible figs are either white or black.

White varieties.—Abakour amellal (early white), Ar'nim, Thar'animt, Thabouhiaboult, Abouh'archaou, Tha'erat, Thadhefouith, Thamellalt, Thar'elit, Thâameriouth, Thabellout', Aberzigzaou, Thaouassifth, Aboulil, Abouzouggar', Thakournennaïth (the round).

Violet varieties.—Abakour aberkan (early black), A'enjar, Azaïch, Thâzaïcht, El-Hadj, Abelr'endjour, Mezzith, Aouhalal, Ar'animaberkan, Thabouhiaboult, Thaberkant, Abouremman, Azagour guilef (Boar's back).

The variety called Thar'animt is the most valued among the white figs, and the variety known as Ajenjar is considered the finest black kind.

Caprifigs.—There are four named varieties of caprifigs. These are: Thadoukkarth-en-tifouzal, Thadoukkarth-en-thar'animt, Thadoukkarth-en-thaberkant (black caprifig), Thadoukkarth-en-t'it-en-tesekkourth (Pheasant's eye caprifig). The best variety is the Thadoukkart-en-tifouzal. The name of the caprifig in general is "doukkar." These varieties of caprifigs are used indiscriminately. As regards caprification some kinds are better than others, the difference being in the time of maturity, in the number of crops, and in the number of wasps.

There is another variety of wild fig known as Thadoukkart guir'zer (Greek caprifig), but the fruits of this kind are never used for caprification. This tree is used for grafting. The tree is inhabited by a Blastophaga wasp not suitable for caprification.

Propagation of the fig tree.—There are four different ways in which the fig tree is propagated. These are cuttings planted directly in the orchard, cuttings planted in the nursery and later on transplanted, suckers taken from the base of the tree or from its roots, and, finally, layers.

Cuttings planted in the orchard are known as "thisekkar." They grow well and rapidly, but are supposed not to bear for several years. Cuttings planted first in the nursery are called "thimer'eras." After two or three years these are transplanted into the orchard. These young trees bring a price of from 30 to 50 centimes. The suckers are known as "ouchelikhen." The name for layers is "ourk'ilen."

When a fig tree is planted, a trench is dug; not a simple hole, as for other kinds of trees. Several slits are made in the trunk in order to facilitate the growth of roots. The time for planting is between October and March. The trees are generally set in groups of five, though irregularly.

Grafting is also used, but only when it is desired to change one variety into another, or in order to rejuvenate some old trunks. Grafting with scions is practiced in February and March, while budding is practiced from March to June.

Cultivation, etc.—In very cold winters the buds of the more delicate varieties are covered with a plaster composed of cowdung, in order to prevent injury from frost. The first work in winter consists in cleaning the trunks of the trees—cutting off the suckers and superfluous surface roots. Sinks are dug around each tree in order to hold the rainwater. When manure is had, it is placed in these sinks. Plowing is done with oxen when the proprietor is wealthy enough to possess them; otherwise the trees are simply dug around. Ancient practice stipulates that the first plowing should be made from January 10 to 23. The second plowing should be between February 13 and 19, while the third and last takes place either between April 10 and 20 or between May 1 and 21. In some places pearl barley and turnips are planted between the trees after the last plowing, but such crops are always considered detrimental to the fig trees. No pruning of the trees is practiced.

Caprification.—The caprifig is known as the "Doukkar," which signifies "male." But as the Kabyles are ignorant of the sexual elements of the caprifig or of plants in general the presumption is that the origin of the name is very ancient, and we are naturally carried back to a time when the people knew more of the nature of plants than they now do in those parts. The Blastophaga wasps are of a black color. Those, however, from the wild caprifig, known as "thadoukkart guir'zer," are brown. These latter insects are not able to caprify the edible figs. The caprification is practiced in the same general way as elsewhere in the Mediterranean countries. Strings of four caprifigs are thrown over the branches of the edible figs. The number of strings (imalak'en) varies with the tree. If necessary, as many as 100 strings or 400 caprifigs are used on a single tree. On the plains more strings are used than in the mountains, the average number of strings being, perhaps, 20 to 30 on a tree. After a few weeks, when the "doukkar" begin to dry up, the process of caprification is renewed. This is repeated as many as four to six times during the summer. The expense of caprifying the trees is considerable. Each string of caprifigs costs about 5 centimes, which brings the highest cost of caprification for a single tree up to 5 francs a year. Some tribes forbid the exportation of caprifigs outside of their boundary, but as a rule the markets are full of caprifigs, offered for sale during the period when caprification is considered necessary.

Figs requiring caprification.—Not all fig varieties require caprification. Those varieties which do not require caprification are Abakour, Ar'anim Abouh'archaou, Abouremman, Azagour guilef, Azaïch, Aboulil, Abelr'endjour, Thazerat, and Thadhefouith. The varieties which it is necessary to caprificate are Thar'animt, El-hadj, Abouzouggar', Mezzith, and Thâzaïcht.

The brebas are known as "Ourgalen," except those of the variety "Abakour," the brebas of which are called "bakour" (early).

Curing and drying.—The figs are dried on trays made of reeds. The latter are exposed to the full glare of the sun, but are stacked at night, 15 or more trays being superposed one on the other. When dried, the figs are stored in earthen jars or in large baskets. In order to keep away vermin, leaves of the sweet bay and of the "zater" (*Calaminta nepeta*) are interposed among the figs. The mode of packing used in Greece is also in vogue in the districts nearest the Mediterranean, but this more elaborate way of packing is used only for the figs destined for exportation. The quality is generally good, but the packing is always poor and prevents extensive sales and high prices.

From 18 to 25 francs are realized for a kilo of the best dried figs.

FIGS IN ITALY.

Cato, who lived two centuries before Pliny, knew 6 varieties of figs. In the beginning of the Christian era Pliny, the well-known naturalist, enumerated some 27 different varieties. The names given them are either from the places where they were growing or they were named after persons who had introduced them or who cultivated them. Thus we read of Rhodian figs, of others as African, Hyrcanian, Lydian, Tivolian, Herculean, Pompeian, Livian, the latter introduced by Livia. As might be expected, these figs are not so minutely described as to enable us to identify them with kinds now existing in Italy or elsewhere. From the time of Pliny to modern times we find no published accounts of Italian figs. Still, during the long interval new varieties must have been introduced and originated by chance or otherwise, as the first of the earliest of the modern writers, Porta and Pontedera—the former in the first years of the seventeenth century, the latter a hundred years later—mention a great number of distinct and valuable kinds.

EXTENT AND CHARACTER OF THE ITALIAN FIG DISTRICTS.

While fig trees are grown all through the Italian peninsula and its adjoining islands, the true and principal fig region must be considered as that situated south of Rome, and extending from there to Sicily and the Liparian Islands. In northern Italy figs are grown principally for eating fresh, and as such can not be said to constitute an article of important diet. Few figs are dried, and they entirely for home consumption, not for export. In the southern parts of Italy, however, the fig, fresh and dried, is looked upon as an important and cheap article of diet, especially during the winter months, and the failure to secure a large fig crop is looked upon as a calamity, both on account of the diminished food supply and the pecuniary loss in the export trade; and the export trade must mean, in this part of Italy, not only the export to foreign districts, but the much greater export to Italian districts where figs are not grown, or at least not dried.

While figs are growing almost everywhere in southern Italy, comparatively few localities make fig culture an industry. Thus for fig culture favored spots appear comparatively few and far between, confined to certain valleys or to certain slopes which either through soil, location, or climate conditions produce figs superior for drying.

The most northern district in which superior dried figs are produced is Pozzuoli, not far from Naples. The soil in this district appears to be of volcanic alluvium, especially adapted to producing figs of thin and white skin, good flavor, and great sweetness. In the Naples market these Pozzuoli figs compete successfully with those of more southern districts and bring even a better price than the Calabrian figs. In the same vicinity we find a considerable quantity of dried figs produced on the island Ischia, at Sora in Terra di Lavoro, at Vico Equense, peninsula Sorrentina, etc. As a rule these northern figs are small, averaging about one-third the size of the Smyrna figs, while in sweetness they are hardly equal to the Smyrnas. As we proceed south we find the figs slightly increasing in size, and to some degree even in sweetness. In southern Italy the principal fig centers are found in the provinces of Terra d' Otranto, Cosenza, Catanzaro, and Reggio, the latter generally known as the three Calabrias. Other centers for fig culture are found in the provinces of Lecce, Salerno, and Basilicata. In Terra d' Otranto, on the Adriatic side, excellent dried figs are produced at Taranto, Brindisi, and Melpignano. In Lecce, in 1873, the two communes of Cutrofiano and Galatina produced 5,700 quintals or 638,000 pounds of figs, while the three ports, Taranto, Gallipoli, and Brindisi, exported in 1872 about 70,000 quintals, equal to 7,840,000 pounds. The whole exports of the province Terra d' Otranto for three years of 1870 to 1872 reached 132,099 quintals, 1 quintal being about 112 pounds.

The production of dried figs in the immediate vicinity of Lecce in 1869 reached 11,000 quintals, and has since that time somewhat increased. In the province of Catanzaro the exportation of figs, in 1874, amounted to 7,000 quintals, or 780,000 pounds. In the province of Cosenza the three principal localities for the production of dried figs are Cosenza, Castrovillari, and Paola, while the following communes also made a specialty of drying figs: Amantea, Belvedere,

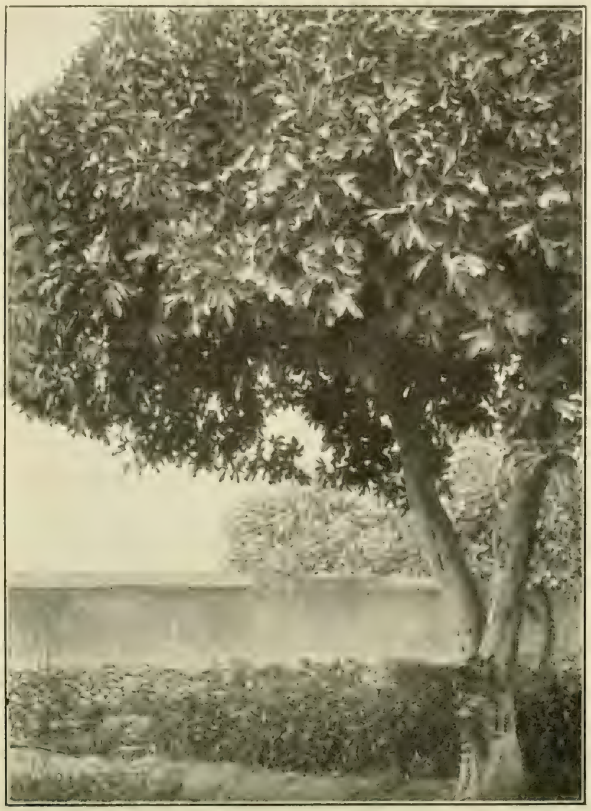


FIG. 1.—CAPRIFICATED FIG TREE IN EASTERN SICILY.

Tree is of a Smyrna variety and is hung with strings of caprifigs.

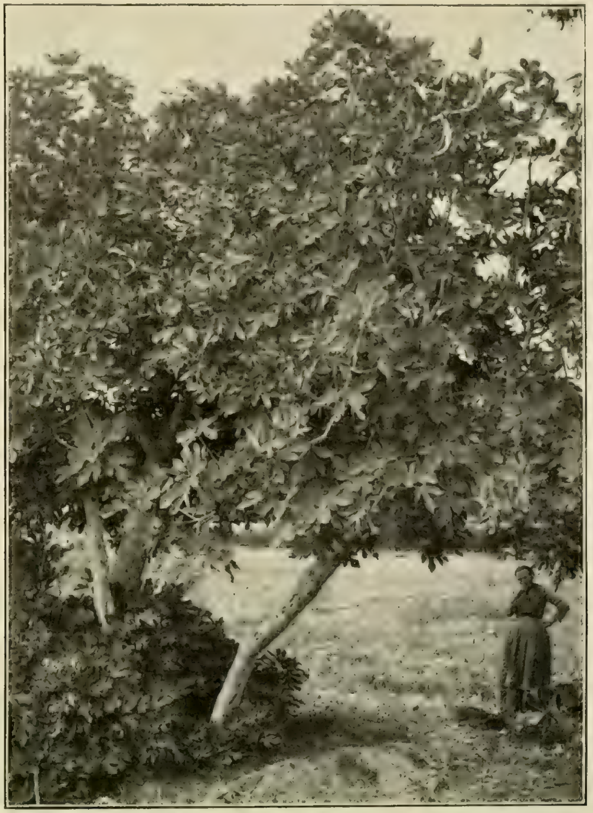


FIG. 2.—CAPRIFIG TREE IN SYRACUSE, SICILY.

Photographs by N. B. Pierce.

Belmonte, Longobardi, San Lucido, Scalea, Cleto, Serra di Aiello, Fiume-Freddo, Santa Domenica, Majerà, Orsomarso, and Verbicaro.

In the province of Reggio the dried figs are produced for export, principally in the vicinity of Reggio, Palma, and Gerace, the latter place being especially famous for its dried figs. In Terra di Bari the fig regions are found in the vicinity of Moropoli and Turi, the figs from the former locality being among the largest and sweetest in southern Italy.

As could be expected, the island of Sicily produces good and sweet figs. Foremost are those from the vicinity of Palermo, among which may be found the largest figs produced in Italy, almost equaling those of Smyrna in size, while exceeding them in sweetness. The principal localities for figs in that province are San Fratello and Pollina. The Palermo figs do not equal the Smyrna figs in flavor and thinness of skin. (Pl. IV.)

The province of Messina, rich in oranges and lemons, also produces good figs, though immediately around Messina no fresh figs are produced, that town importing its supply from the ports of Calabria, on the other side of the Straits. The principal export port in the province of Messina is Milazzo.

In the province of Catania it is especially in the region of Mount Etna that superior dried figs are found. The volcanic soils favor the drying quality of the figs as well as their sweetness. Figs are also prepared for drying in the other parts of Sicily, but nowhere to the same extent as in the provinces of Palermo, Messina, and Catania. The figs from the island of Lipari are, however, considered superior to those grown on the main island. These figs are exported principally to Naples and Malta.

CLIMATIC CONDITIONS.

In most of the Italian fig districts the best figs for drying are grown on or near the coast of the Mediterranean. The influence of the sea, be it through modified heat or through increase in moisture, is decidedly beneficial. The climatic conditions for the production of figs in southern Italy are almost perfect, and inferior only to those of Smyrna in Asia Minor. But for the successful drying of figs, not to say curing of figs, the climate of Italy is not the very best. At the time of the fig harvest it not infrequently happens that showers, or even continued rains, set in, injuring or even completely spoiling the figs. On that account the growers resort to such measures as splitting the figs or drying them by artificial means in primitive ovens. In climatic conditions for drying Smyrna is much more favored than Italy. The natural rainfall in Italy is slightly less than that of Smyrna, but greater than that of southern and central California. The irrigation of fig trees is therefore less necessary in Italy than in California.

QUALITY OF ITALIAN FIGS.

But with all these favorable conditions Italy produces only figs which are inferior to those of Smyrna, though equal to those of Portugal, Spain, or France. It is especially in size and quality of pulp that the Italian figs are defective, averaging one-third less in weight than the Smyrna figs. Their flavor is also inferior, while in sweetness they are equal, or in a few instances even superior, to the figs of Asia Minor, Smyrna included. As regards albuminoids, so important when the nutritious quality of the figs is taken into consideration, the Italian figs take a very prominent place, but are still inferior to the Smyrna figs. In fatty substances the Italian figs are perhaps superior to the Smyrnas, but the percentage of superiority is too small to be of any economic importance. In thinness of skin and in color the Italian figs of the best kinds compare unfavorably with Smyrna figs. To sum up, the Italian figs are inferior in size, aroma, and albuminoids, but excel in sweetness and in other minor matters. Their meat is generally coarse.

MODES OF CURING AND PACKING.

As Italy does not in reality produce any first-class figs, it could not be expected that she would excel in curing and packing. Only where a very superior product is the outcome of careful horticultural methods does it pay to spend much labor and skill on attractive packing. The Italian figs are grown principally for home consumption by the poorer classes of the people, and the object has therefore been to cure and pack as cheaply as possible. The exports are considerable, but the figs, instead of serving as table desserts and delicacies, are destined principally for distillation or for the adulteration of coffee, etc. Still, the Italian figs of the better classes, if properly put up and more carefully and cleanly handled, would command a market and a price far beyond that at present received. The Italian modes of curing could be imitated profitably in the United States, especially when an expensive article is not contemplated. The time will come when our horticulturists will occupy themselves with the problem of preparing articles of food as well as of luxury, and they may then find some points of interest in the Italian modes of curing figs. In Italy there are three principal ways of curing and drying the figs, these methods being used promiscuously in different parts of the country without being confined to special localities.

The most common way is, after the figs have been properly picked as early in the day as possible, to split them lengthwise down to the peduncle or stalk end, where the two halves are allowed to remain connected. This splitting serves a double purpose, enabling the operator to detect the poor or sour figs and facilitating the drying of the fig. The splitting also does away with the laborious turning of the figs while drying. As soon as split, the figs are exposed on wicker trays or straw mats for drying. The interior surface is turned upward: otherwise the contents would run to waste. The time for drying varies from six to ten days, according to locality and climate. The figs are then taken in and dipped, which is done by placing them in wicker baskets and immersing them for a minute in boiling water. When removed the figs are thrown in heaps to drain off and dry and are then ready for packing. Such figs are in the province of Catania called figs "a chiappa" (flattened).

Another method nearly related to the former consists in splitting and drying the figs just as last described. When nearly dry the figs are flavored. This is done in different ways in different localities—a quarter of a walnut is pressed into the pulp, or a piece of citron rind, or the pulp is simply sprinkled with anise seed. Such flavored figs find ready sale all over Italy, and not a few are exported to foreign countries.

The third way of drying figs is known as "passuluni" (wrinkled) in Catania or as "cuzzoli" (drawn out) on the mainland in the Calabrias. When perfectly ripe the figs are carefully cut with a knife from the tree and then distributed on mats made of split cane (*Arundo donax*), the mats being spread on low beds of earth. The figs are turned every day or every two days and exposed to the full rays of the sun. The more frequently the figs are turned the better, many persons turning them several times daily. In from ten to fifteen days the figs have become bleached and dry externally, while the pulp remains soft, at least in the better specimens. The figs are then assorted and graded. Dipping in hot water for one minute comes next and finishes the operation of curing. The most careful curing is done in Catanzaro and in the district of Palermo, in Sicily.

PACKING.

The packing of Italian figs is quite primitive, owing to the scarcity and expensiveness of lumber for boxes. Braided mats, made either of strips of beechwood or of esparto grass (*Stipa tenacissima*), holding from 33 to 44 pounds each, are the most common packages for all export figs destined for distillation, etc. Table figs are generally exported in round drums made of wood shavings containing 12 to 15 pounds of figs, there being no uniform packing. For home consumption the better classes of figs are strung on split reeds or esparto straw.

The packing of figs is further advanced in Sicily than elsewhere in Italy. The packing called "pania" consists of piercing the figs with split canes, a sixth part of a cane being the proper thickness. Two and two figs are placed overlapping each other with the stalk ends, and a sliver of cane is then run through this overlapping part. Another sliver is run through the thick end of each fig. In this way more figs are put on and these slivers of cane are made to hold a loaf of figs 4 inches wide by 20 inches long.

This packing is varied almost indefinitely in different places. Figs are strung on the elastic and tough straws of the esparto and finally rolled up in the shape of balls or in wheels (scerti di ficu). The squares are generally known as "tavolieri" (tables) or "pania" (loaf).

Some of the largest figs are also picked and dried without skin and known as "ficu senza scorcia" (without skin) in the Catanian dialect.

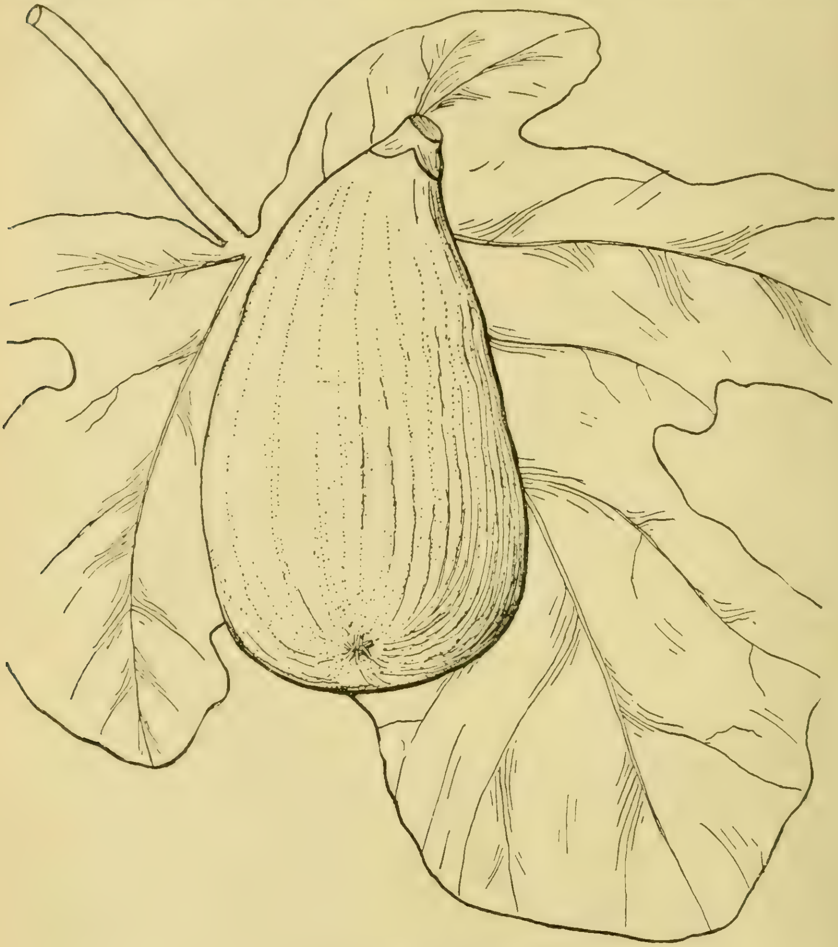


FIG. 5.—White Genoa fig.

A confiture is made in some districts by dipping the nearly dried figs in honey, then packing them in jars, and baking in an oven. In all districts common bake ovens of most primitive construction are used for drying inferior figs or for finishing the drying of the regular figs in case of rain or continued fogs. But such artificially dried figs are inferior both as regards color and quality and bring much less in the market.

VARIETIES OF FIGS.

The varieties of figs grown in Italy are many, in some localities reaching a hundred or more. A great uncertainty exists in regard to names. Local names are given everywhere, and as no systematic descriptions of all the various varieties have ever been published, no

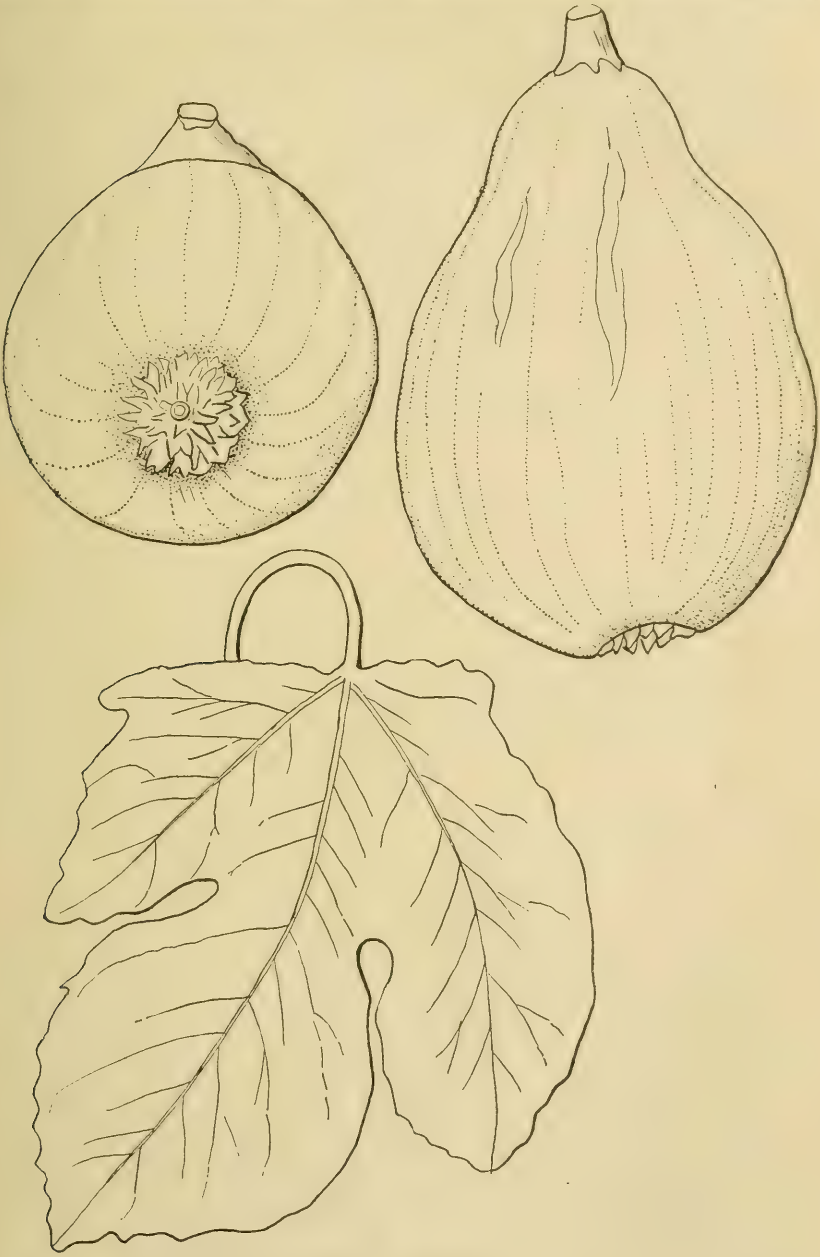


Fig. 6.—Gentile fig.

efforts have ever been made to identify and classify them. The most common fig used for drying is the Dottati, Datterese, or Dattero, the "figue datte" of France, the date-fig of the English, so called on account of its sweetness and the readiness with which it dries. The Dattero is the drying fig for the Calabrias and the south of Italy generally. The size of the fig is below medium; color is light, and so is the pulp. The color of this fig is equal to that of Smyrna figs. The Petrogiano is another drying fig used in the province of Catanzaro, but not equal to the former.

The figs commonly eaten in Italy are legion, but the best is considered the Trojano, principally grown in the vicinity of Naples. The "fico di fragola," or strawberry fig, is a favorite in Sicily, while in the north, in Toscana and Umbria, the "Verdini," the "Brogiotto neri" and "Brogiotto bianchi," the "Fico Gentile," (see fig. 6), and the "Portoghese" are the varieties mostly cultivated. The San Piero, Black and White, are among the largest early figs in central Italy, but are little known in the south. This fig, which produces only first-crop figs, or "fichi fiori," is replaced in the south by the "Colombro" and "Paradiso," which also give excellent figs.

CAPRIFICATION.

Caprification is practiced only in southern Italy, and not everywhere in this locality. Most of the Italian varieties do not require caprification, and, so far as I know, none of the true Smyrna figs—with only perfect flowers—is grown in Italy. As localities where caprification is especially practiced there may be mentioned Sicily, Catanzaro, the old Kingdom of Naples, Ischia, etc.; also the islands of Lipari and Malta.

The total annual output of Italy in dried figs shipped to various countries reaches about 18,000,000 pounds in favorable years, while in years of smaller crops it may fall to 9,000,000 pounds.

FIGS IN PORTUGAL.

The country around Lisbon and farther south is well adapted to the fig industry, and fig trees grow everywhere. The late Dr. John Bleasdale, who was familiar with Portugal, considered the country surrounding Lisbon for 20 miles as especially favorable for figs, the large white figs being most appreciated. But the figs raised in the vicinity of the capital, though large and sweet, are not the best for drying and export; they are consumed principally at home, whether fresh or dry. With the increase in temperature toward the south the fig improves in quality and the conditions become more favorable for drying with the least amount of labor. Accordingly we find in the most southern province—Algarve—the real home of the fig industry on Portuguese soil. Few countries in any part of the world are as well favored with regard to climatic conditions as this famous province, and, with the single exception of Smyrna, or rather the valley of the Meander River, no locality in the world produces figs of quality equal to the Algarve figs. The province of Algarve is an open littoral, gradually rising from the beach toward a high chain of mountains, which, with an easterly and westerly trend, shut off the northern winds. The exposure is toward the south alone, the heat being moderated by the balmy Atlantic breezes. What Andalusia is to Spain, Algarve is to Portugal—the orchard, garden, and granary of that Kingdom. The deep alluvial soil is one that contains much lime and naturally retentive of moisture. The temperature of the province is remarkable for its even distribution, with only slight variation day and night, spring, summer, and fall. The mean summer temperature is about 79° F., and this mean lasts from May to November. The highest is in August and September, with 82° F.; the lowest in May and November, with 77° F. The moisture of the air is considerable, or about 73° for the summer months of May to November. Compared with California localities, none are exactly similar; but El Cajon, one of the interior valleys in San Diego County, comes the nearest. Compared with the large interior valley of California the moisture in Algarve is much greater, being about 70°, while in the San Joaquin Valley it is below 50° during the same summer months.

The fig in Algarve grows to great perfection, and it is found everywhere from the seashore to an altitude of about 1,100 feet. In fact, the principal product of the district, whether we consider quantity or value, is figs. But besides figs the country produces oranges, almonds, olive oil, and wine. The country is only partially cultivated, the improvements rarely extending farther inland than 6 miles from the coast line.

Not many years ago the figs of Portugal were the most famous in the world, or at least the best known in western Europe. In the early part of the last century Portugal supplied England, America, Germany, and the north and west of Europe, generally, with figs, but was later on driven from the market by the superior and better-managed product of Smyrna. The Portuguese figs were known as Faro figs, because they were exported from Faro, in Algarve. For a long time Faro was the principal business place in southern Portugal and, as such, also the export place for figs. The figs which were grown in the vicinity on the rather sandy plains and in the foothills of Sierra San Miguel were naturally of very good quality or almost of the very best quality, but they were very badly handled in drying and curing and only commanded the foreign market until a better article was offered. The peasants generally carried the figs fresh or partly dried to the city and sold them as such to the merchants, who again dumped them out in small heaps on the stone floors in the warehouse. Maltreated in this way the figs were usually bruised and a large part of the sirup ran out and collected in narrow gutters and finally fermented in tanks. After fermentation of the surplus fig juice a kind of brandy of very good quality was distilled. The figs were again spread on stone or cane floors in the open courts and gardens and exposed to the sun for a longer or shorter time, according to the weather. When dry the figs were pressed into small baskets made of braided palm leaves, each basket holding 28 pounds. The number of varieties of figs grown in Portugal is very great. The fig used for drying in Algarve is a large, white fig different from the Smyrna figs, so far as may be judged from descriptions. The best variety in Portugal is known as the "figo da Comadre," or Godmother fig, so named because the best is always reserved for the comadre and the compadre, words hardly to be translated into English, but which play a great part in the home life of the Latin races.

The next best variety when dried is known as "figo mercante," while the third and poorest kind goes under the name of "figo chocho."

Of these figs large quantities are yet exported, principally to Belgium, Holland, and France. The annual export averages 8,000 tons, or about one-half that of Italy.

The first crop, the fiori or the brebas, is known in Portugal as "figos lampas," while the second crop is called "figos vendimos." For table use the red-fig varieties are considered the best. In the vicinity of Faro the "figo do euchario" and the "do bispo" are the most valued varieties. The Lampeira is one of the best red figs, producing only a first crop, called the lampas. In Italy this fig is known as the Portoghese, and is considered a very good early fig, somewhat like the San Pedro. As regards culture and curing little is to be learned from the Portuguese. For cutting the figs from the trees a long bamboo pole is used, the end being split or forked. Below the fork a small basket of braided straw is hung to receive the falling fig, which is easily detached by pushing the fork upward. Only the best figs—a comparatively small proportion of the crop—are dried. This drying is on mats woven of the esparto grass (*Stipa tenacissima*). As a result of the poor handling of the fig, this industry has decreased greatly in recent years. Portuguese table figs, which were once the staple article of figs in the western world, are now hardly known outside of Portugal, the carefully cured and beautifully packed Smyrna figs having driven the Portuguese article almost out of the market.

The glory of Faro, as regards figs at least, is past. The harbor has become much filled in, and few figs are now sent abroad from this port. The trade in figs, on a much diminished scale, has been almost completely transferred to the better and more readily accessible port of Villa Nova do Portimão. Fig culture and curing have of late progressed but little in Portugal. Curing and packing, as practiced in Smyrna, are entirely unknown. When the Portuguese figs were refused by the foreign trade the cultivators and merchants did not inquire into the cause and made no effort toward improvement. The consequence has been a ruined business, which is not likely to revive soon. With proper care the Portuguese figs would really be very good, almost equaling the Smyrna figs.

CAPRIFICATION.

Caprification is practiced everywhere in Portugal. The caprifig is known as "figo di toca," the name not being derived from "tocar," to touch, as indicated by Link and other writers, but from the Arabic word "tokkar" or "dokkar" (the wild fig), showing that caprification was introduced, or at least reintroduced, by the Arabs or Moors. This caprifig belongs to the type with broad leaves. The caprifig, or figo di toca, ripens its first crop in Algarve at the end of June or beginning of July, and a later crop setting at this time becomes ripe in August. The process of caprification is the same as in other countries and deserves no special mention here. The Portuguese fig growers know that not all fig varieties require caprification, and that in some varieties the first crop may not require caprification, while the second crop does require it. The Lampeira, which is grown principally around Tavira, belongs to the class which requires caprification for its second crop, but which matures a first crop without it. The first crop or camada of the Lampeira is also called "figos lampas" and is never caprificated. The second crop or camada of the Lampeira, known as "figos vendimos," is said to never set and mature except with caprification, which accordingly is always practiced. "Figo euchario," which also requires caprification, ripens only one crop, in September. The "figo bravo," which is cultivated along the River Guadiana, gives also only one crop, which does not require the figo di toca, and accordingly is never caprificated.

The annual export of Portugal is about 16,000,000 pounds.

FIG CULTURE IN FRANCE.

FAVORABLE LOCALITIES.

In France profitable fig culture extends from the environments of Paris to the shores of the Mediterranean. While in the north figs are grown for use only while fresh, in the south they are also dried for export and home consumption. Provence is the center of the fig industry in France. There the climate is mild and favorable for olives, figs, pomegranates, and to some extent also for citrus fruits, but on the whole the favorable conditions for the fig industry are not equal to those in southern Italy and Sicily. In winter the frosts are sometimes severe enough to greatly injure the fig trees, but their recuperative nature is such as to readily renew the injured parts. As in all the Mediterranean region, the rains are frequent in winter, few or none during the summer months. Irrigation is frequently resorted to and is not considered injurious if judiciously applied. Figs destined for drying are irrigated less than those for use in the fresh state.

In the most favored localities the fig trees are planted 18 to 20 feet apart and smaller crops are grown between; but on account of the fungus which frequently and fatally attacks the roots of the figs and rapidly spreads from one tree to another where they are growing so close that the roots interfere with one another, most fig trees are alternated with almonds or olives.

The closer to the Mediterranean the taller are the standards or trunks of the fig trees, and the farther away from those shores the less the trunks, both in height and circumference, until in the vicinity of Paris the trunks disappear entirely and give way to a cluster of branches issuing direct from the soil.

The trees with high standards suffer most from heat and dryness; consequently high-standard fig trees are found only in localities where irrigation is practiced. After the tree has been planted, generally from a cutting, it is allowed to grow as it pleases for two years. The effect is the development of numerous suckers from the base. In March of the third season the largest of these is selected to form the future standard, while the others are cut away. On this standard all side branches are cut until it has reached a height of 2.30 meters, or about 7 feet. The top bud is then pinched in the spring and side branches are allowed to form immediately below, constituting the coming head or crown of the tree.

Pruning is very little practiced, although in some localities fig trees are pruned to some extent. Suckers are removed from the base; dry branches as well as branches which cross one another are cut away, and branches which bend too close to the ground, interfering with other crops, are cut off. But the general rule is that the less the fig tree is cut the better for the tree. Whatever pruning is required is done in March or April. The cultivation of crops between the trees also suffices for the figs. Where no irrigation is practiced a hollow basin of earth is formed around the base of the fig tree early in the fall in order to catch the winter rains. In exposed localities the trees are protected in the following manner: In the middle of December or the beginning of winter the space around the tree is dug up and the soil heaped around the stem as high as possible in order to protect it from cold. In the beginning of April this earth is again leveled down and the soil dug up anew. The succeeding labors are confined to irrigating the trees once a month until the end of August, when the harvest of the figs begins.

It has been found that manuring greatly improves the figs. Light soils are manured with cow dung every two or three years, while for heavier soils sheep, horse, and pigeon dung are used every six or eight years. But the best manures for figs are offal from factories, such as wool waste from mills, as well as bone dust.

In southern France or Provence the following localities are especially renowned for their figs, fresh or dry, and in their vicinity may be found large plantations of figs: Aix, Salon, Marseilles, Brignoles, Toulon, Grasse, Antibes, St. Remi, Entrecasteux, Bandol, Seyene, Tarascon, Nice, Bordeaux, Treves, Hyères, St. Tropez, St. Maximin.

CURING THE FIGS.

When the figs are perfectly ripe they are picked early in the morning, after the dew has dried off. There are at least two ways of curing the figs in France. In the first method the figs are simply placed on trays made of wicker willows, exposed to the sun, and turned every morning and every noon.

The other process consists in dumping the figs into boxes after they have been exposed for two or three days and then allowing them to go through a sweat for forty-eight hours. After that time they are again exposed and the drying is finished in the sun. At the approach of showers the trays are stacked and covered with waterproof canvas. Every morning the dried figs are taken out. When all are dried they are separated into three different sizes. Ovens are used for inferior figs only.

PRINCIPAL FIG VARIETIES GROWN IN SOUTHERN FRANCE.

The following are the principal varieties of figs grown in southern France:

White varieties.

Napolitain, second crop; ripens in September; fresh and dry. At Aix and Salon.

Verdale; fresh and dry; ripens in September. At Brignoles and Salon.

Bourdisotte blanche; fresh and dry; ripens in September. At Marseilles.

Aubique blanche; for drying only.

Ragusa; ripens in the middle of September. At Marseilles.

Hospitalier; for drying; ripens in the beginning of September. At Salon.

Doucette; fresh and dry; end of August. At Salon.

Messongue; fresh and dry. At Salerne.

Boutilete; for drying. At Brignoles.

Marseillaise, figue d'Athènes; for drying only; end of August. At Marseilles and Toulon.

Seyroles; for drying. At Grasse and Draguignan.

Versailles; fresh; middle of July.

Pissalutto; fresh and dry. At Grasse.

Peconjudo; fresh and dry. At Grasse and Antibes.

Cougourdane. At Aix and St. Remi.

Tibourenque; fresh and dry; middle of September. At Marseilles and Salon.

Col de Signora; fresh. At Rousillon.

Beaucaire; for drying. At Entrecasteaux.

Blanquette; only for drying in localities where other drying figs will not do well.

Colored varieties.

Quasse blanche; for drying; end of August. At Bandol and La Seyne.

Figue-datte (Dattero-Italy); fresh and dry; end of August. At Salon and Eyguieres.

Poulette; fresh or dry; end of August. At Tarascon and Salon.
Cotignano; first crop middle of July; fresh; very extensively cultivated.
Mahounaise; fresh; middle of September. At St. Remi.
Cuer; fresh and dry; middle of September.
De Saint-Esprit; first crop fresh; end of June. At Marseilles, Aix, and Salon.
Matarassa; for drying only; end of August. At Grasse.
Rose blanche; for drying only; middle of September.
Safranée; fresh and dry; middle of September. At Nice and Salon.
Franche Paillard; first crop only; fresh.
Aubique violette; fresh only.
Bellona; fresh and dry; very fine. At Grasse, Marseilles, and Draguignan.
Courcourela; for drying only. At Grasse.
Beaucaire; for drying only. At Grasse and Hyères.
Grosse Beurdoa; fresh and dry. At Grasse and Saint-Tropez.

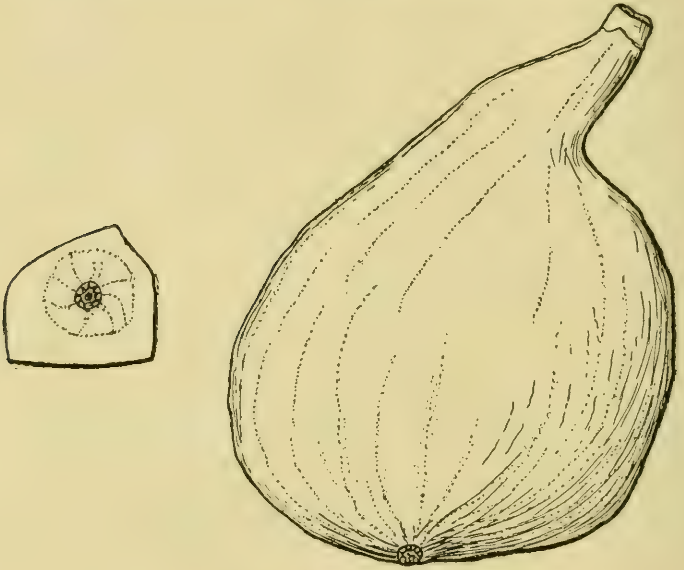


FIG. 7.—Ronde Noire fig.

Black varieties.

De Porto; fresh and dry. At Seyne and St. Maximin.
Barnissotte; fresh only; September and October.
Bernissenca; a later form of Bourjasotte noire; fresh only.
Mouissonna; fresh and dry; one of the best figs of southern France.
Sultane; fresh. At Salon.
Perruquier; first crop only good; fresh; end of June.

The best figs for drying in southern France are: Marseilles, Grassenque, and Mouissonne. Farther north near Orange the varieties mostly used for drying are the Blanquette and Verdale.

The earliest variety for table use in southern France is the Observantine and the latest are Bourjasotte noire and Mouissonne violette.

NORTHERN AND CENTRAL FRANCE.

In the vicinity of Paris fig culture rises to a prominent horticultural industry in at least two localities—at Argenteuil and at Frette. Through care and ingenuity most excellent figs are raised there in the open ground and under a climate not naturally adapted to the fig. During three hundred years Argenteuil has supplied Paris with fresh figs, and fig culture in that locality has reached a scientific development not known elsewhere. The methods followed there are superior to any employed elsewhere in similar or higher latitudes and produce better results than figs grown against walls and protected by mattings during the winter months. If the methods of Argenteuil and Frette were adopted in the United States fig culture would prove profitable even in a number of places in the vicinity of many of the large cities east of the Rocky Mountains, where there is always a market for choice fruit. In the hope that such a culture will soon spring up a minute description is given of the processes used for perfecting or, as they call it, for "educating" the figs in Argenteuil.

LOCALITY AND CONDITION.

The best place for a fig orchard is a warm exposure toward the south, sheltered as far as possible from heavy winds, as the latter destroy the fruit irreparably. Locations free from spring frosts are, of course, to be preferred; in fact they should be the only ones selected, as late frosts retard the maturing of the figs and may even entirely spoil the crop. Argenteuil and Frette are favorably situated, but still they suffer from frosts in February and March almost every year. The best soil is calcareous loam of great depth and warmth.

HOW TO START THE TREES.

The fig plantations are generally started from trees. These again are grown from cuttings about 16 inches long, taken in February or March or as soon as the branches are disinterred. These are planted in nursery, leaving only two eyes above the ground. In November these cuttings will have obtained good roots, and as the leaves will then have fallen with the first frosts, the cuttings may be taken up and used for immediate planting. In case planting shall be delayed until the following spring it will be necessary to cover the rooted cuttings in a way similar to that done by the trees, the process of which will be described presently.

FORMING THE ORCHARD.

The trees are planted either singly or in rows, squares, or quincunx, about 9 to 10 feet apart. No large plantations exist, as the great labor and care necessary for success would make supervision of large orchards impossible. The holes for the trees are dug about 3 feet square and about 2 feet deep. One or two trees are planted in every hole. When two trees are set in one hole this is done not only in order to quickly get many fruit-bearing branches, but also to cause the trunks to bend readily to the ground. If two are set they are planted 1 foot apart and in the general line of the row. The depth is regulated according to the size of the trees. All the old wood should be buried below the surface and only the season's wood exposed above. The trees are not set perpendicularly, but must be slanting or oblique with the surface, in order to facilitate the future bending of the trees. If the ground is level the two trees should form an obtuse angle with each other and a sharp angle with the surface; in other words, bend in opposite directions. If the surface is inclined, then both the trees should be slanting upward, in order that both may be equally well buried. After planting each tree is cut back to two eyes. If the planting has been done in November the young trees must be covered over with 1 or 2 feet of soil. At the end of February or the beginning of March this soil is removed and the ground worked over. Around each tree is made a basin about 8 to 12 inches deep and 2 or 3 feet in diameter, to hold the rain water or the artificial watering during the season. Thus planted, the trees are left to themselves for the season. In the following November, after all the leaves have fallen, the soil is dug away from the tree to a depth of 10 inches, especially immediately below the principal branches. These are then carefully bent down into the trenches and covered with about 14 inches of soil, the surface of which must be made convex, in order to shed the water. It is also important that no leaves, immature figs, grass, straw, or any other matter which possibly could decay should be left in the soil near the branches, as it would cause the latter to rot. If the branches do not readily remain in the ground they may be kept there with a bent peg similar to the pegs used in rooting layers. In February, as soon as the frosts are over, the soil is taken away. The strongest branches are pruned back to two or three eyes, while the weakly ones are removed entirely. It must be the endeavor to give to each fig bunch from 14 to 16 branches, but this may be done gradually if good branches are not had the first or second season. The second season is devoted to forming these branches, the strong ones being encouraged, while the weak ones are cut away.

The third season after the branches have been disinterred in February or March, the same pruning back to two or three eyes of last season's wood is practiced. In fact, all the operations of the preceding season are repeated, the cultivator so selecting his branches that the tree, or rather bush, will spread evenly in all directions, so that the branches will not interfere with one another.

PINCHING THE TERMINAL BUDS.

In the fourth season the fig trees or bushes begin to bear. The branches should not be disinterred until all the frost is over. But as late disinterring will cause corresponding late maturity, many growers disinter half of the trees at the end of February and the other half at the end of March, which secures them at least a partial crop. As soon as the branches are out of the soil the terminal buds on all the side branches which are to bear fruit are removed by pinching, either by hand or by shears. The fruit-bearing branches will at this time show the young figs alongside the leaf bud. All branches intended to bear the following season are pruned back to two or four eyes. The skill and experience of the cultivator is here exercised in the selection of the proper branches.

REMOVING THE SIDE BUDS.

A few days after the last operation, designed to push the side buds and the figs, another operation takes place, which consists in suppressing or removing the side buds. On every side branch about one-half or more of the leaf buds are removed, but one or two eyes closest to the base should always be left to form fruit branches for the next year. One bud is also left higher up on the branch. On the Blanquette variety this operation is performed as soon as the buds show signs of starting—on the Dauphine Violette only when they have attained three small leaves. Care should be taken that the young figs are not injured or even touched. If they are, they will not come to maturity. The two lowest buds are preserved to form fruit-bearing branches for another year, and the upper bud is left to draw sap.

The terminal branches are similarly treated, with the difference, however, that the terminal bud is left, with two others lower down, to form future fruit branches, at a distance from each other of about 12 inches. A few days or weeks later, or when the remaining buds have grown out and formed small branches or spurs 2 or 3 inches in length, with a few leaves, they are cut from all lateral fruit branches, care being taken to leave one of the lowest as near the base as possible. The object in not removing them at once is to prevent the tree from being shocked and set back. After the last operation the branches will present this appearance: The terminal branches will have the terminal bud growing, with two more at equal distances lower down the stem; the side branches will have only one of the lowest buds growing and one near the top, which latter, however, should never be allowed to assume more than five leaves, which are sufficient to draw the sap; but in preserving these buds and branches it is important that only those on the outer or lateral surfaces of the branch be preserved. The interior buds, if allowed to grow out, would be very difficult to cover with soil in winter.

CARE DURING THE GROWING SEASON.

After the buds have been removed the branches should be carefully arranged in such a way that they will touch one another as little as possible. This is accomplished by the aid of crotches or pegs, which are set in the ground to hold the branches apart. All leaves which in any way touch the figs should be removed, as they bruise the fruit and spoil its appearance.

At the maturing of the fruit it often happens, especially with the Dauphine variety, that the fruit is too near the soil. The branches must then be somewhat elevated with studs or the fruit will spoil; but in no case must the elevation be such as to raise the branches in an upright position—merely enough to bring the fruit above the ground. If raised too high the fruit will not ripen. In order to guard against spring frost the fig bushes are covered with light mattings early in the morning or in the evening when danger of frost is apparent. Another method is to create smoke by burning tar, straw, and damp wood an hour before and after sunrise.

PRUNING BEARING FIG TREES.

The first ripe figs are picked at the end of July, the last at the end of August. As soon as the last figs are harvested the fig trees are pruned. This operation consists in removing the wood which bore the figs just harvested, while the wood is cut close to the branch immediately below. The dead wood is then removed, as well as useless suckers, and all which are not destined to produce fruit-bearing branches in coming years. The branches which are to bear the next season's crop are not pruned, as such proceeding would ruin the crop. The next season, after the trees are disinterred, the process of pinching the terminal and secondary buds is again gone through with, after which time no new treatment is required; but after the branches have reached a length of 6 to 10 feet they are too long to be practically handled and covered and must then be removed, not all at once, but gradually, a few a year, and new suckers allowed to take their place.

In covering the branches after the trees have begun to bear it will be best to tie them in small bundles, 4, 6, or 8, according to the size of the tree. As a result of being covered yearly these branches never regain their natural vertical direction, but lean more or less horizontally. This also hastens the maturity of the fruit and is an element of success in the growing of figs in cold regions. Previous to covering the branches all leaves and figs should be removed, as they cause decay.

COVERING THE TREES.

Every year, in November, the fig trees must be interred in the soil in a way similar to that already described for the cuttings. This, of course, is the chief work of the season, and entails as much labor as almost all other operations combined. If the trees have been planted slanting properly the difficulty of bending the branches is not great. On level ground the trenches should run in every direction from the root, but on sloping ground they should always run up the hill or somewhat sideways.

In covering the trees care should be taken to make the trenches as nearly horizontal as possible and not less than a foot deep, and to raise the soil sufficiently above to insure against both cold and damp. The center of the tree should be covered more deeply, and a small hill, several inches high, should in winter designate the place where the roots go down. This is necessary to shed the water and protect the roots from excess of moisture. In removing the soil the next February or March a cloudy day should be chosen, the afternoon of a rainy or cloudy day being best. If disinterred in bright and warm sunshine the change is too great and the trees may suffer from being scorched by the sun.

OILING THE FIGS.

In southern France—in Argenteuil and in Frette—a process is performed called "apprêter les figues" or hastening the figs. In Argenteuil and in Frette it is employed on all the figs which are desired to ripen early, the proper time for this process being of the utmost importance. If done too early the figs will not ripen at all, but will dry and spoil. The proper time is when the fig begins to color and the skin begins to feel soft, or about seventeen days before it would regularly mature if left alone. Toward evening, if possible, a single drop of good olive oil is placed on the eye of the fig, care being taken not to spread the oil. The oil is placed on the eye by means of a wheat straw and in such a way as to touch only the center of the eye. The next day the fig shows a change and in nine or ten days it may be cut, perfectly ripe, the operation having hastened the ripening of the fig certainly from six to eight days. Such treated figs are also better, sweeter, and with smaller seeds than those which have not been oiled.

VARIETIES AND CROPS.

As before stated, only the first-crop figs come to maturity in that part of northern France under consideration, and only fig varieties which produce such figs are grown. The one most generally grown in Argenteuil is the Blanquette; at Frette the Dauphine Violette, a later but better variety, is the favorite. The Rouge de la Frette and the Observantine are also cultivated to a limited extent.

In Argenteuil alone 200 acres are devoted to figs. In Frette very many less. The value of the crop in Argenteuil, in 1884, was 100,000 francs.

Along the coast of Brittany, principally at Croisic and Cherbourg, fig culture is quite extensive, the mild coast climate being much more favorable to the fig tree than that of the interior of central France. Strangely enough, the varieties most cultivated are one with perfectly developed male flowers and another with degenerate male flowers. On the Channel Islands the fig tree assumes the shape and size of a small tree and requires no protection during the winter.

POINTS OF SUCCESSFUL CULTIVATION.

The following are the essential points in successful fig culture in the open air in all northern districts where the climate is too rigorous to allow standards:

(1) Inclining the trees when planting in order to facilitate the yearly interment of the trees.

(2) Semihorizontal position of the branches, in order that they may catch as much air and heat as possible; otherwise the fruit will not ripen.

(3) The consequential dwarfing of the trees and total absence of a trunk or standard above the ground.

(4) The yearly practices of procuring and forcing fruit branches and fruit, which consists in pinching the terminal buds, suppressing the lateral buds; removing the fruiting branches as soon as the crop is harvested; preparing new fruit-bearing branches for the next season; these should always be situated as close to the main stems as possible, etc.

(5) The yearly interment of the branches, which necessitates the previous removal of all leaves, figs, and dead wood.

(6) The subsequent disinterment of the branches, which is always to be done in cloudy or rainy weather, in order that the change may not be too sudden.

(7) The renewal of the main branches every twelve to fifteen years, as by that time they begin to be too old and too stiff to cover in winter.

PRODUCTION.

While France exports considerable quantities of figs, its imports are much larger. The following table gives an idea of the trade for five years:

Year.	Imports.	Exports.
	Kilograms.	*Kilograms.*
1887	18,600.000	597,800
1888	12.642,000	834,341
1889	13,109,000	941,893
1890	16,502,000	967,589
1891	14,053,000	413,309

The principal consumers of French dried figs are Belgium and Switzerland. The countries which supply France are Turkey, Italy, Spain, Portugal, and Greece.

FIG CULTURE IN ENGLAND.

Fig culture in England dates back several hundred years. It is more than probable that the first figs were introduced by the Romans, but that the trees died out from want of care and knowledge after the Romans had left the country. Plantations were confined to the southern countries and were probably never generally cultivated. In the reign of Henry VIII the fig was again introduced, it is said, by Cardinal Pole, who brought the trees from Italy. Hortus Kewensis tells of fig trees being planted in England in 1548, and Gerard says in 1597 that the fruit of the fig tree "never cometh to maturity with us except the tree be planted under a hot wall." In 1629 Parkinson said: "If you plant it not against a brick wall, it will not ripen so kindly." And later on, in 1640, the same author says, in Theatrum Botanicum: "The bleu figge is no doubt of the same operation with the white to all purposes, but the fruit commeth most to maturity with us, and is eaten with great pleasure with salt and pepper." After the middle of the seventeenth century we may consider fig culture well established in England. As late as 1822 a tree was seen in the botanical garden of regius professor of Hebrew in Oxford University. The tree was planted by Dr. Pocock in 1622, and must have then been nearly 200 years old. In the eighteenth century the fig orchards of Tarring, near Worthing, in Sussex, were famous and proved very profitable. These orchards were grown as standards, and the crowns of the trees were said to have been 40 feet in diameter. They seldom ripened more than the first crop. In the beginning of the last century some of these Farring trees were 40 feet high and ripened two crops a year. In our day fig trees are quite common in gardens in the southern countries of England and grown principally against walls. The first crop is always the one which is depended upon, the second crop being generally too late to ripen. The trees are not pruned where the culture is properly understood. By far the greatest number of fig trees are grown in England under glass, or at least under winter covering, and a large number of varieties has been imported from foreign countries. Under glass both crops come to maturity. For outdoor cultivation the favorites, as being the most hardy, are Brown Turkey and Brunswick. Dr. Hogg, who is the English authority on figs, recommends the following varieties for English gardens:

(1) For standards: Black Ischia, Brown Ischia, Brown Turkey.

(2) For walls: Black Genoa, Black Ischia, Brown Ischia, Brown Turkey, Brunswick, Castle Kennedy, White Marseillaise.

(3) For forcing in pots: Angelique, Black Ischia, Brown Ischia, Early Violet, Negro Largo, Pregussata, White Ischia, White Marseillaise.

The Frette and Argenteuil methods described elsewhere are not adopted in England. Of course all figs grown in England, either outdoors or in pots, are consumed fresh and bring a good price in the market. In England an immense number of fig trees is grown in pots in storehouses, and such culture has been most profitable, as well as insuring a continuous crop of figs for many months in the year. The most convenient sizes of pots are those of 12 to 15 inches for fruiting trees, but smaller pots may also answer. While at rest the pots are kept in cool houses free from frost. The best soil for pots consists of three-fourths sandy loam, the balance mortar crushed fine. Repotting is done in October, just before the leaves fall. The soil should be moderately rich, liquid manure being applied when required.

When starting in the spring a temperature of 50° should first be given, later increased to 60°. Give as much sun as possible and keep the air moist. It is a mistake to keep the air very dry. Fresh air should be given when the temperature outside reaches 75°, and the inner temperature should then be brought up to 95° or 100°.

A single standard is best. When the new shoots reach 6 inches they should be pinched back and checked. By a successive pinching of respective shoots a successive crop of figs may be had.

Weak growth should be cut off and thinned out close to the stem to prevent shading. During fruiting the air should be kept much drier and the temperature should be even. Any check in the growth of the trees during fruiting time may cause the figs to fall before maturity. The most favored varieties and those most readily grown in pots are Brown Turkey, Negro Largo, Violette Sepor, and St. Johns.

Imports of figs to the United Kingdom.

	Pounds.		Pounds.
1876	16,316,300	1882	7,357,800
1877	9,691,000	1883	12,343,400
1878	6,724,300	1884	13,189,600
1879	10,532,700	1885	11,316,200
1880	8,591,300	1886	11,425,300
1881	13,822,500		

The import of dried figs to Great Britain now averages yearly about 200,000 hundredweight. The greatest quantity, or about 15,000,000 pounds, comes from Italy; Spain furnishes about 5,000 pounds; Portugal, Greece, and Turkey, small quantities.

FIG CULTURE IN SPAIN.

The production of figs in Spain is enormous and large quantities are exported to France, Austria, etc., principally for distilling. In 1882, 1,100 packages or mats of dried figs were exported from Malaga to the United States. In 1800 this district produced 16,000 quintals, which in 1823 had risen to 20,000 quintals.

Cuttings are planted slanting, and grafting is done in April, while the eye is yet dormant, but after the sap has started flowing.

The following are some of the most favored varieties in the vicinity of Valencia:

(1) *Gombaya.*—Rose to bright rose; stem of tree blackish; requires moist soils.

(2) *Burjasot.*—One of the best figs in Spain, as well as in the Mediterranean generally. Fruit black, round, and flat at apex. Tree with weeping branches.

(3) *Verdal and Gironnetta.*—Small, green figs, round, very sweet. Skin thick and hard, of bright green color; pulp red.

(4) *Palopal and Napolitan.*—Fruit very large and fine.

FIG CULTURE IN THE SOUTHERN STATES OF NORTH AMERICA.

While the fig tree grows and bears well in the Southern and Gulf States of the United States of America, it is not raised there as a commercial product, except on a very limited scale. The cause must be sought in the climate of the region, so unlike that found in the Mediterranean districts. While in the latter the winters are mild, with few frosts and rainless summers, the Southern States are frequently visited by heavy winter or spring frosts, the summers being more or less rainy. In the winter the trees are often killed or seriously injured by frost, while in the wet summers the figs rot and mold, and drying out of doors is made difficult.

In favorable seasons only do the figs attain a certain perfection in maturity and sweetness and are then very good and palatable. Even in such season drying and curing out of doors is not attended with success. As a consequence no large fig plantations exist in these States, the tree being principally grown for home use. In such capacity it is found everywhere, especially toward the extreme south, along the Gulf of Mexico. While the fig may not be profitably grown in the Southern States, if the object is to prepare them by drying for the markets, it is nevertheless certain that fig culture may there be made profitable. For canning, making jams, jellies, fig sauce, and other fig preserves, the fig of the Southern States may be made available with little expense or difficulty. Of late years a most delicious preserve is made from the Celeste fig. It is being extensively placed on the market in the form of canned goods, and is considered by some persons as superior to any put up for commercial purposes in any of the Pacific States. In Louisiana and in parts of Texas the fig does well and requires no especial care in cultivation. In the pine lands of Mississippi, Alabama, Georgia, Florida, and South Carolina they require more attention in the way of fertilizing to produce favorable crops. Of late years Florida fruit growers have given considerable attention to fig growing, but the results have not yet been such as to warrant extended plantations. The rainy summers are the principal drawback to the perfect ripening of the fruit.

GEORGIA.

In the Gulf region, especially near the coast, many varieties do exceedingly well and produce very delicious figs, but of a regular fig industry there is no trace. In time it may come. The following account is from letters received from Mr. P. J. Berckmans, of Augusta, Ga. It plainly shows that very much remains to be done for fig culture in that vicinity:

> Here we cultivate with success Brown Turkey, Celestial, Green Ischia, Black Ischia, and Brunswick. These are, all things considered, the most desirable kinds and are usually found under cultivation. I have some 20 varieties, of which some are occasionally successful, but not as reliable as those named above. Of this class I name: Blue Genoa, good but not prolific; Violette Ronde and Violette Longue, both of fair quality, but unproductive and apt to crack before maturity;

Angelique or Coucourelle Blanche, small, of poor quality; Marseilles Blanche, not productive; Nerii, very good but very unproductive, except in the immediate seacoast belt; Pregussata, very good, but a shy bearer; Black Havana, very prolific and of good quality, but tender; San Pedro and White Adriatic are regularly winter killed here and are undesirable even in Florida; White Four Seasons, very dry and inferior, but prolific; Madeleine Blanche, unproductive; Jaune Hative is very similar to Angelique; Lemon (probably White Genoa), excellent but unproductive here; succeeds well on the coast; Rouge Longue de Provence, of second quality, unproductive; Superfine de la Saussaye; this I believe to be the same as Violette Longue; White Smyrna—we have three varieties under this name, all inferior, and we can not arrive at a correct nomenclature.

The following description of the curing of the fig in Georgia is given by one of the growers there:

Gather the figs when the skin begins to crack (this is a sign of maturity and the fruit then contains the largest amount of saccharine matter). Make a strong lye of oak ashes, or take common cooking soda dissolved in hot water. Dip the figs in the hot liquid, leaving them there for only a few seconds; expose immediately to the air for a minute or two and repeat the dipping a second time. If the lye is hot and strong enough the color of the fig will immediately change, the dark-skinned varieties to a dark green, and the light-colored varieties to a pale green. The object of dipping the fresh figs in hot lye or a solution of bicarbonate of soda is to kill the milky juice and thus hasten the drying. A basket loosely made so as to allow the liquid to come freely in contact with the fruit is always desirable for use in dipping. Place the figs upon trays made of wooden slats and expose fully to the sun, taking the fruit under cover every evening, as it will spoil if the dews fall upon it. The fruit must be turned in the sun every day, and in three to four days it will be ready to put away in small wooden boxes, putting a layer of spice laurel leaves (*Laurus nobilis*) at the bottom and covering the top with another layer of these leaves. Place the lid on tightly to keep insects out, and keep in a dry room. If a brick oven is convenient it will facilitate the work and hasten the drying, but care must be taken not to give too much heat. If the fruit secretes sirup it has been put under too high degree of heat, and the result will be an inferior article. After the fruit is partially dried it should be lightly pressed by the hand to flatten it. Light-colored varieties are the best for drying, but the Celestial and Brown Turkey are much richer in quality, although presenting a darker and less attractive appearance.

The Celestial dries the most readily of all our varieties, but makes the least valuable article as regards quality. The Brunswick, being very large, seldom gives good results with ordinary means, but will doubtless be easily managed with improved drying apparatus.

The figs generally grown in the Southern States are the Celestial, Brunswick, Ischia, Brown Turkey, and half a dozen more varieties with local and uncertain names.

FIG CULTURE IN MEXICO.

BAJA CALIFORNIA AND SONORA.

These two States of Mexico are well adapted to fig culture, especially the former. In Baja California the fig crop not only furnishes considerable food, but a considerable amount is exported to the other States of Mexico, though as far as known none go elsewhere. The figs, which are black and of the Mission variety, are grown principally in the central portion of the peninsula, from Purisima and Comondu to La Paz. Irrigation is required, as rains are seldom of sufficient quantity to sustain the tree and mature its fruit, except possibly in the mountain regions in the vicinity of natural springs or creeks.

Nowhere is less care taken in the cultivation of figs and in preparing them for market. The figs are simply dried on the smooth ground, on the top of the flat-roofed houses, on mats, or on anything else convenient. When dried and shriveled they are packed in 100-pound packages, the receptacles being made of rawhide of cattle and sewed together. These packages are very strong and stand the roughest handling. The figs are sticky, sirupy, and sweet, but inferior from want of care in curing and handling. They are sweeter than the same variety dried in California, and as well flavored as this kind of figs can be. Considerable quantities of black Mission figs are dried at Purisima. These figs are split before drying and sprinkled with anise seed. They are very good. The brebas are here used for drying in preference to the later crop.

In the mountains of the cape region from La Paz to San Jose del Cabo wild figs called the "Salate" are not uncommon, especially at a height of 1,000 to 3,000 feet in the canyons or on the northern slopes. This fig tree (*Ficus palmeri*), which carries a small, edible, round fig of poorest quality, is an evergreen tree.

The climate for producing superior figs is unexcelled on this peninsula, and there is no doubt that Baja California has a great future as a fig-growing country. In Sonora, on the Mexican mainland, two or more species of evergreen wild figs are found in the mountains, all having edible fruits, but small and of poor quality. The writer saw no variety in Sonora except the Mission black fig (Pl. VI, fig. 1), the fruit of which is consumed fresh. The black brebas or first-crop figs are large and really very fine. They ripen in May and have a great local reputation, the greater as fruits of all kinds are comparatively scarce in Sonora. No dried figs are prepared in Sonora; at least none worth mentioning. Still it is believed the climate would be suitable. The brebas or first crop is ended in May, and the second crop matures in July. It could be dried and all out of the way before the rain sets in.

The climate of this part of Mexico and Baja California is dry, but the air is damper than in upper California. Rain falls from June or July to November. The dry season extends from November to June or longer. Little rain falls, and after a shower the ground dries quickly. Frost is rare. In summer the thermometer frequently reaches 115°, especially around Hermosillo and Guaymas.

CHAPTER III.

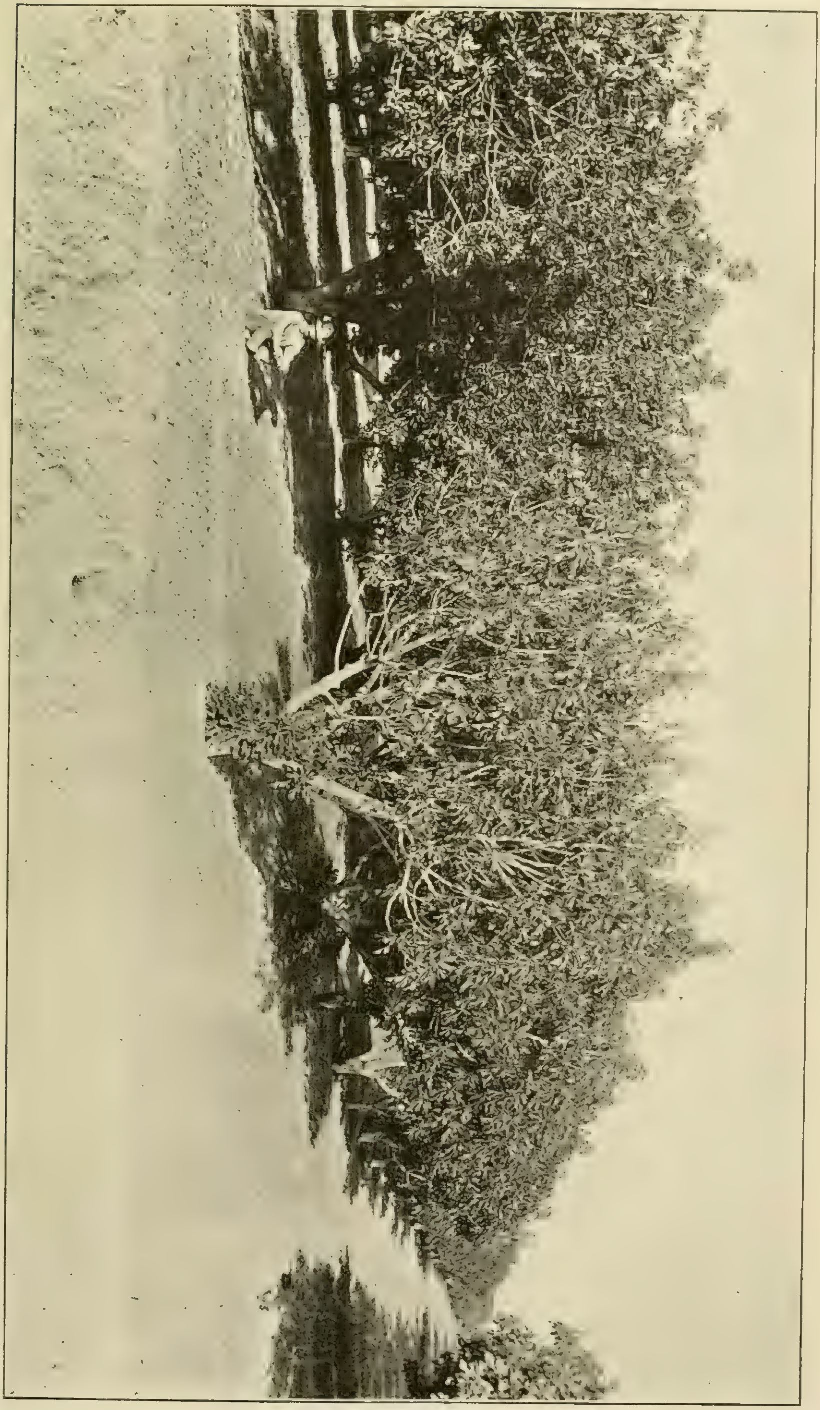
FIG CULTURE IN CALIFORNIA.

HISTORICAL NOTES.

The first fig trees in California were brought by the mission fathers of the Franciscan order. Where the first trees were planted and whence they came no one can now tell, but it is known that they must have come with the first missionaries in the eighteenth century, who planted them with the olive and the vine. Unlike the latter two, there was only one kind of fig, now known as the "Mission fig," indicating that it was raised from cuttings and not from seed. As the same Mission fig is the only fig variety extensively distributed in Mexico, it is safe to presume that the fig came from there, and not from Spain or Portugal or Chile, as is generally supposed. From Mexico the Mission fig spread to several of the Southern States, although it appears to have thriven less there than in California. The Mission fig must have been brought to Mexico centuries before, probably with the early missionaries from Spain after the conquest of the Mexican country. For a century the Mission fig was the only fig in California, the only fig cultivated, or rather planted, around the "missions," the only one found on the Mexican ranches, and was sparsely distributed over the country. With the arrival of Americans some of the immigrants from foreign countries brought fig cuttings from their cherished trees to plant in their new homes, and this will account for some odd varieties yet growing in out-of-the-way corners, and for others of which we yet hear some early settlers tell—trees which were long ago cut down or otherwise destroyed. With the advent of the 50's some systematic efforts were made to import other kinds of figs. The first importations came, of course, from American Eastern nurserymen, and the first figs consisted of varieties cultivated under glass in these Eastern States, which accounts for the little subsequent value of those varieties for outdoor culture. Among such varieties were Brunswick, Ischia, Brown Turkey, and a few others. Next came importations from English nurserymen; later from French nurserymen; but only within the last decade have efforts been made to import directly from foreign countries.

To give a list of all such importations would be of considerable interest to the student of California figs and their history, but it has been impossible to collect all the information required, and reference

PLATE V.



A CALIFORNIA FIG ORCHARD. ROEDING ORCHARD, FRESNO, CAL.

Photograph by H. H. Alexander.

will only be made to a few of the most prominent of such introductions. While there has undoubtedly been a number of small importations, there are a few which require special mention.

In the mountainous parts of central California we find Felix Gillet as one importer of French fig varieties. In Stockton, W. B. West imported from various countries. John Rock, of Niles, has at various times brought large collections of figs to this State. G. P. Rixford was the first to bring the true Smyrna figs here direct from Smyrna in 1880, while in southern California the late John Grelck, a horticulturist of great knowledge and foresight, imported and distributed many valuable French figs. Another importer who should not be forgotten—his enthusiasm was certainly very great—was the late G. N. Milco, of Stockton, who brought a number of Dalmatian figs (Cernica, Zimitza, Kargigna) to California. Between 1882 and 1885 the author imported some 30 varieties of figs from France. In the latter year W. C. West was sent by F. Roeding to Smyrna and subsequently sent here several varieties of Smyrna figs. F. Pohndorff, then of Niles or vicinity, imported the White San Pedro under the name of Breba from Spain and distributed it in this country in 1883 or 1884. Dr. J. D. B. Stillman, of Lugonia, visited Smyrna in 1878 and selected Smyrna cuttings, which were, it is supposed, finally planted in California. Nothing came of this importation, as the box containing the cuttings could not be traced with certainty after its arrival here, and the figs which Dr. Stillman supposed to be Smyrna figs were proven afterwards to be Brown Turkey, and undoubtedly never came from Smyrna. Finally, it may be added, a Greek gentleman, Mr. Honcherenko, lately living somewhere between Niles and San Ramon Valley, has imported and grown a number of varieties from his native country.

One of the earliest importers was W. B. West, than whom none is more worthy of being remembered. In 1853 he imported from Hovey & Co., of Boston, White Genoa, White Marseilles, White Ischia, Brown Ischia, Brunswick, and Brown Turkey, which figs were all propagated and widely distributed over the State. In 1869 Mr. West imported from France, through English houses, from 28 to 30 varieties of figs for the table and some for drying. They came via Panama in good order. He saved 16 varieties, but found only a few of them of any value in Stockton. Among these figs Mr. West received the Adriatic under another name (Verdoni?), now forgotten by him, and it is probable that to this importation the large grove of Adriatics at Knights Ferry, in Calaveras County, Cal., owes its origin. A few years later, in 1878, Mr. West went to the Mediterranean to study fruit culture. He selected there several varieties of figs, of which he has, however, unfortunately destroyed the record; but among these figs was the famous Neapolitan fig "Trojano." This fig did not prove satisfactory at Stockton and was never distributed.

As a rule Mr. West found that the fine varieties which he imported produced much better figs in the foothills of the sierra than in Stockton, and he was the first to recognize this region as superior for fig culture.

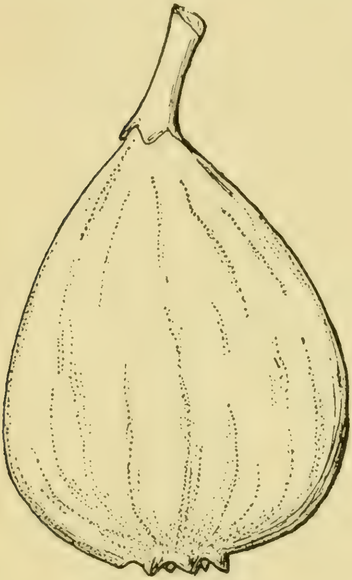


FIG. 8.—Du Roi fig.

Among California importers John Rock stands most prominent. He has imported figs at various times from foreign countries, and possesses now the most extensive collection on the Pacific coast. The trees are at Niles, Cal., not far from San Francisco. Of the earlier importations there is no record, but in the spring of 1883 he received from Thomas Rivers & Son the following figs: Barnissotte Grise, Angelique, Col di Signora Bianca, De Constantine, Negro Largo, Early Violet, Lardaro, Black Marseilles, Drap d'Or, White Genoa, Bondance Precoce, Brown Ischia, Prolific, Monaco Bianco, Brunswick, Bourjassotte Grise, Rocardi, Col di Signora Nera, Grosse Grise Bifère, Royal Vineyard, Hirta, Brown Turkey, Ronde Violette Hative, White Marseilles, Bourjassotte Blanche, White Ischia, Du Roi (fig. 8), Agen, Dorè Norbus, Pasteliere, Raby Castle, Bourjassotte Noire, Grassale, Black Ischia, Ronde Noire. In 1889 he received the following figs from a house in Provence, France: Salette, Martale, Rosso di Mensiglia, Grosse Violette, Des Dames, Biànca Morcati, Angelique, Avarcugo, Crovere, De Calabria, Á Feuilles Trilobes, Courcourelle, Giallo Verde, Giallo Rotondo, Negrondo, Madalena, Aubique Leroy, Ronde Rouge de Provence, Imperial, Rolandina, Turco di Constantinople, Mascula. In the fall of 1890 the Department of Agriculture at Washington, D. C., sent to Mr. Rock the Trojano, Dottato, Brizanzola, and Guigliana; and from a local nurseryman were received in 1891 the Capri, Smyrna, Verdale Longue, Cernica, Zemitza, etc.

Felix Gillet, of Nevada City, Cal., has at various times imported from France figs of the following varieties: Pagaudiere, Noir Moutier, Buissonne, Madeleine Blanche, Grosse Marseillaise, Datte, De Versailles, Franch Paillarde, Napolitaine, Verdale. These were imported in 1874. The following varieties were sent to Mr. F. Gillet from the United States Department of Agriculture, Washington, D. C., and are now being tried by him: Dalmatino, Broghetto, Rubaldo (undoubtedly Rubado), San Piero, Dottato, and San Vito.

THE BULLETIN IMPORTATION.

The importation of the genuine Smyrna figs to California was first due to G. P. Rixford, at that time connected with the San Francisco Evening Bulletin, which was then the acknowledged authority on horticultural matters in California. The following account is taken from the edition of that paper of October 17, 1888 and is, it is believed, from the pen of Mr. Rixford himself:

IMPORTATION OF FIG CUTTINGS.[1]

Believing the soil and climate of California perfectly adapted to the growth of fruit equal to that imported from Asia Minor, also believing that failure to produce such fruit in the State was due to the absence of the right variety of tree, in 1880 the business management of this journal determined to make an effort to introduce a tree which produces the true fig of commerce, with the view of placing it in the hands of the subscribers of this journal throughout the State. In furtherance of this object the assistance of the Hon. E. J. Smithers, then United States consul at Smyrna, was solicited in procuring and shipping to New York, thence to be forwarded by rail across the continent, a lot of 500 cuttings of the best variety obtainable in that country. On the 1st of May, 1880, the following letter was received from Consul Smithers:

CONSULATE OF THE UNITED STATES,
Smyrna, March 31, 1880

BULLETIN COMPANY, *San Francisco.*

GENTLEMEN: Yours of January 24, requesting my services in procuring and forwarding some fig cuttings for distribution among the subscribers of your paper, was received on the 3d instant, together with a draft on London.

Immediately after the receipt of your letter I sent a trustworthy man to the fig district, situated about 75 miles from Smyrna. Owing to the severe stormy weather which prevailed at the time, the cuttings did not reach Smyrna until the 10th instant. I then learned that there would be no steamer for Liverpool before the end of the month, and deemed it better not to complete the packing until the last moment. The case was successfully shipped on the 29th, and the steamer left today. As directed, the bill of lading was forwarded to H. K. Thurber & Co., New York, and Richard Stewart, 11 Manchester Building, Liverpool, has been requested to look after its transshipment.

The case is 5 feet in length, 3 feet wide, and 2½ feet high. It contains 448 plants, packed in rich clay loam, such as the fig trees flourish the best in here. The packing took place under my supervision, and was after the plan of your letter. The top of the case is fastened down with screws, so that it can be easily opened at New York, and the plants, if they should need it, watered.

It is not possible to obtain rooted trees in this country, the fig-orchard men preferring to plant the cuttings in the field where the tree is to remain. My man was informed that owing to the warm weather in February it was too late to remove rooted trees, otherwise I could have sent you a small number. * * *

I inclose herewith a statement of expenses incurred, which, you will perceive, do not exceed your remittance. There being no drays in Smyrna, the heavy case had to be moved by porters and then by lighter to the ship lying some distance in the bay.

Hoping that your undertaking will be more successful than the others that have preceded it, I remain, gentlemen, very sincerely, yours,

E. J. SMITHERS.

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[1] In these cuttings Mr. W. B. West, of Stockton, had a one-fourth interest, and upon the arrival of the cuttings he took his share to his Stockton nursery and propagated his cuttings there. Governor Leland Stanford was also interested in this importation, the success of which was mainly due to his aid in facilitating rapid transit across the continent, and to the fact that he paid most of the expenses. His share of the cuttings was planted on his Vina Ranch, in Sacramento Valley.

Allusion is made in the letter to two unsuccessful attempts to forward shipments of fig trees to this city, one of which was completely dried out and dead on its arrival, and the other was mislaid somewhere while en route and never reached its destination at all.

The case of trees forwarded by Mr. Smithers did not reach this city until the 8th of June, 1880. A considerable portion of the wood had rotted, and the season was so far advanced that the cuttings, when planted, although the greatest care was taken with them, made but a feeble growth. However, 200 of them had formed roots during the summer and promised in time to make thrifty trees. To distribute this small number was altogether out of the question, where each of several thousands of our applying subscribers was expecting to receive a tree. About this time Consul Smithers arrived in San Francisco, en route to Chin Kiang, China, to which consulship he had just been promoted. He informed us that at the time the shipment was made he had caused to be planted 4,000 cuttings, which had in the meantime become rooted trees and which we could purchase from the party who then owned them at from 8 to 10 cents each, the usual price of trees in Asia Minor. It was then determined, rather than disappoint our subscribers who were expecting their promised fig trees that season, to import the whole lot. Funds were therefore forwarded to an agent in Smyrna to purchase the trees referred to and to ship them at once. About the 1st of April, instead of the trees, a letter, dated February 16, came to hand, from which the following paragraph is taken:

> I have had Mr. ——— at my office, who says that the 4,000 cuttings he had planted, and to which your order refers (on E. J. Smithers's suggestion), have by this time grown up into strong young trees from 4 to 6 feet high, and he is offered $1 per tree at the nursery at Aidin. He says he can not afford now to part with them at anything under $1.25 each from this port (first cost).

The owner of the trees was an Armenian, a race of notoriously sharp traders, and put the price up to an exorbitant figure, because he thought he could get it, and probably has the trees on hand yet, the story of the offer from another purchaser being most likely a pure invention.

Correspondence with our agent, a prominent merchant in Smyrna, was kept up during the summer, and in September, 1881, orders were sent to make a large shipment of cuttings to the Bulletin Company, which we found could be obtained at a reasonable price. Every precaution had been taken to secure the safe arrival of this consignment, even to shipping moss from New York in which to pack the cuttings. The cases, on arrival at New York, were repacked by Peter Henderson & Co. before starting them across the continent.

The shipment consisted of 14,000 good cuttings, and arrived in excellent condition. A large portion of these cuttings were distributed early in 1882 to Bulletin subscribers in all parts of the State. It was estimated that about one-third of this first distribution escaped destruction by gophers, drought, and other casualties. Many of these were planted in unsuitable soil and unfavorable locations as to climate, so that but few favorable reports were received regarding them after they were old enough to commence bearing. In most localities the trees made a rampant growth, but the fruit dropped before ripening. Parties who had visited the fig orchards of Asia Minor were sure that we had been imposed upon, and had received some wild and worthless variety which grows along the fences and dividing walls of that country. Much other adverse criticism, principally from business rivals, was published, and further information was sought from our agent in Smyrna. He wrote that it was impossible that wild cuttings were sent, as it was easier and cheaper to get the best, as that variety was most abundant; and furthermore, that "the cuttings were obtained from one of the most renowned orchards in the Aidin Province." About this time E. J. Smithers, for twenty years United

States consul at Smyrna, was in San Francisco again, and was taken to our nursery of fig trees. At that time the trees were covered with fruit, and he at once said that they could not be the wild fig, for the reason that the wild variety never attained so large a size as the fruit on the trees before him. He was satisfied that the variety was all right. W. B. West, of Stockton, who has probably imported more kinds of fig trees, and first brought to notice the Verdone, an Italian variety, which has been christened "White Adriatic," in this State than any other man in California, and who had a part of our importation, never for a moment doubted that he had the right variety. Feeling convinced from reports from a few favored localities that we had made no mistake, several thousand more cuttings were distributed in the winter of 1882-83 and again in 1885-86. These further distributions thoroughly disseminated the variety.

As Mr. Rixford says, much adverse criticism was made on the failure of the Bulletin figs to ripen their fruit, and many who ought to have known better pronounced the figs wild figs, which had been maliciously substituted by the Syrians. It is now known that this was an error and that the varieties were the genuine Smyrna figs. On the other hand, many reports came in stating that the Bulletin figs had borne fruit. Among the reports which caused the greatest sensation was one made by a gentleman at the fruit-growers' meeting in Chico, November 22, 1888. This long controversy can not now be referred to in detail. Enough to say, the gentleman submitted dried figs supposed to have come from two Bulletin figs growing on his place in ———, Cal. The figs were said to have been cured without sulphuring. It is now known that these figs were not the Bulletin figs, but simply the "Adriatic," and that the figs had been sulphured before drying in order to give them a good color. It is now absolutely certain that no Bulletin figs have come to perfect maturity in California without artificial pollination, as has been described elsewhere, and the nature of this fig variety is such that they never can fully mature without pollination or caprification, this being a conclusive proof of their being the genuine Smyrna figs of commerce.

The history of the Gentile fig in California has somewhat the touch of a romance. In 1851 or 1852 Mr. Robert Farlay, of San Leandro, Alameda County, found a small package outside of the post-office in San Francisco. It contained two cuttings, which were planted in his nursery. The tree was killed by gophers, but a cutting was saved and grown, and gradually became large. Farlay propagated the fig tree and sold trees around the country. In 1886 Dr. Ed. Kimball, of Hayward, took a cutting from a large tree of this fig growing in the town of Hayward and planted it on his place near the town. The original Hayward tree is now cut down, but Dr. Kimball's tree is yet a fine large tree bearing well. The writer has seen other trees of this same kind in other places near Niles, at West Oakland, and also on Central avenue, in the town of Alameda. It is remarkable that such a fine fig has not been more widely distributed, though it has been in the State for forty years. This fig is now planted at Knights Ferry, Cal., where it produces very fine first-crop figs, which dry well.

The second crop drops always, as might be expected, it having the same habit in Italy.

The Adriatic fig, of which so much has been said and written, has probably been growing in California for nearly forty years, as some large trees at Big Oak Flat, in Calaveras County, were supposed to be of this variety. Certain it is that it has been scattered over the Sierra foothills for many years, though not known under any special name.

The first importation of which the writer is fairly certain was made by W. B. West, of Stockton, Cal., who received this tree, together with 21 or 22 other varieties of figs, from an English nursery, by way of Panama, in 1865. He sold trees to several parties, among them Captain Gray, of Merced County, who planted them on his ranch at Atwater.

Later another gentleman of Stockton, Dr. Sposati, is also said to have received the same tree from its native home on the east side of Italy, under the name of Fico di Fragola, and distributed it here under the translated name Strawberry fig. The late G. N. Milco, of Stockton, claimed to have been the first importer of this variety, which, however, is an error. He found the trees growing on the ranch of Captain Gray, the trees then being 10 years old, and, recognizing the value of the fig, named it the Adriatic, after his native home (Ragusa), where, however, the tree does not grow. His supply of cuttings, however, came from a tree planted by Mr. Andrew Simpson, in Stockton, who had bought the tree originally from West.

Mr. Milco did much toward making the variety known, but also much toward keeping the growers in the dark as regards its true nature. Since 1884 the variety has been extensively cultivated in California and distributed to many of the Southern States, especially Florida. It is a fine variety in some localities, but in others worthless. Even at its best it makes only a second-quality dried fig, though when fresh the figs are delicious when properly grown.

IMPORTATIONS OF FIGS BY THE UNITED STATES DEPARTMENT OF AGRICULTURE.

By far the most important importations of figs are those made at various times by the United States Department of Agriculture. Fig cuttings have been distributed by that Department almost yearly for the last twenty-five years or longer. In order to obtain for California a properly labeled collection of figs the Department of Agriculture, under Secretary Rusk's administration (1889–1893), was requested to import the whole collection of figs grown in the hothouses of the Royal Horticultural Society of London, the best known collection of figs in the world. Professors Van Deman and Taylor, of the Department, favored the project, which, however, was only brought to a successful issue under the administration of Secretary Morton in February, 1894, and mainly through the good will and efforts of the assistant pomologist, William A. Taylor.

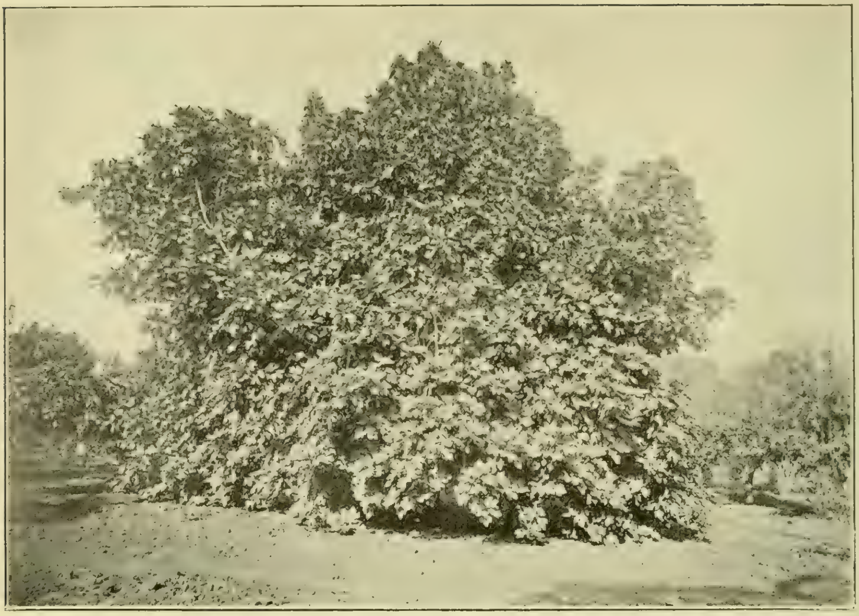

FIG. 1.—MISSION FIG TREE ON TEJON RANCH, KERN COUNTY, CAL.

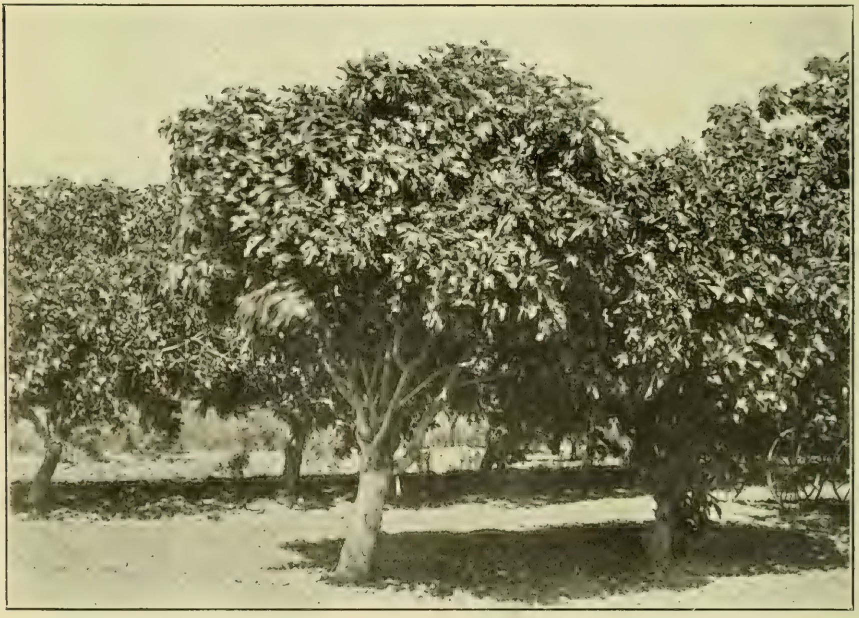

FIG. 2.—GRAFTED SMYRNA FIG TREE. CUTTINGS IMPORTED BY THE U. S. DEPARTMENT OF AGRICULTURE AND GRAFTED AND GROWN BY JOHN ROCK AT NILES, CAL.

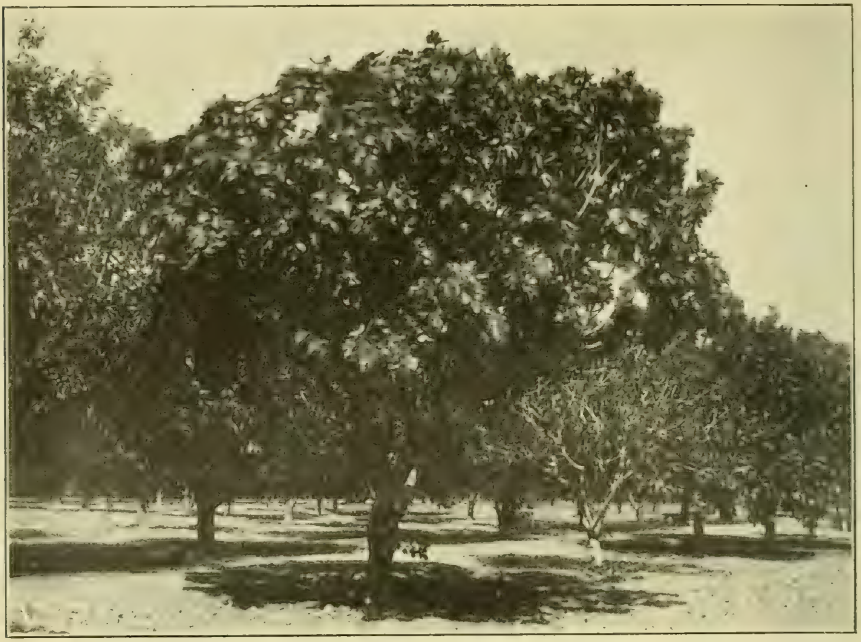

FIG. 1.—BROWN TURKEY FIG TREE, JOHN ROCK ORCHARD, NILES, CAL.

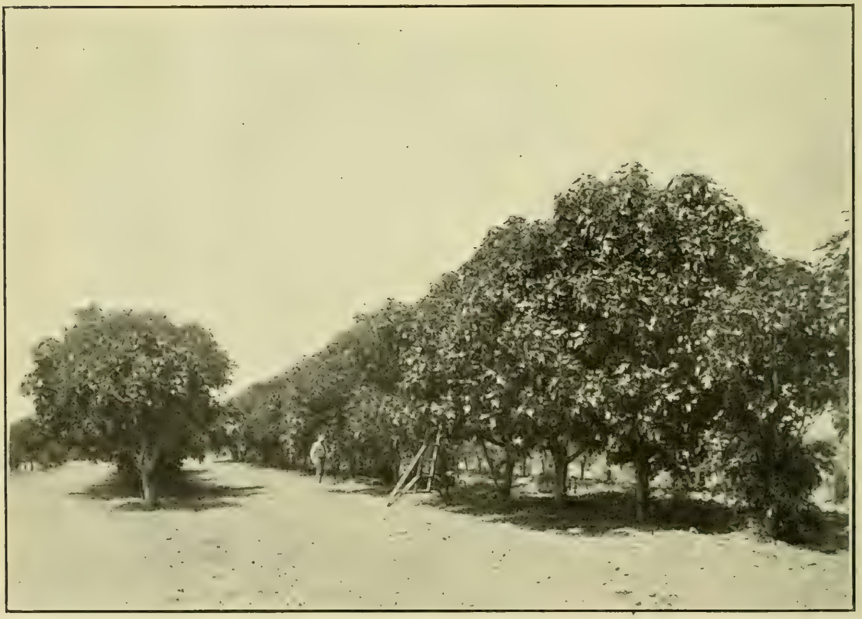

FIG. 2.—FIG ORCHARD OF JOHN ROCK AT NILES, CAL.

The caprifigs are seen where the ladder stands.

The whole of the above-mentioned collection was received by the Department of Agriculture in February, and forwarded at once to Mr. John Rock and the writer, who jointly signed an agreement with the Department in regard to subsequent disposal of cuttings, etc. In all, about 66 named varieties were received in cuttings, which at once were grafted by Mr. John Rock, at Niles, on old fig trees. Great success was achieved, a good growth being had by all the varieties sent, none being lost. (Pl. VI, fig. 2.)

The following is a copy of the memorandum of grafting made by Mr. John Rock:

FIG ORCHARD RECORD.

List of cuttings received from the United States Department of Agriculture grafted in orchard of California Nursery Company, lot 8, Block B, at Niles, Cal., as follows:

Row No. 9.

On tree 1, De l'Archipel.
On tree 2, Boutard.
On tree 3, Grosse Marseilles.
On tree 4, Peau dure.
On tree 5, Negronne.
On tree 6, Bourjassotte Noire.
On tree 7, Poulette.
On tree 8, Œil de Perdrix.
On tree 9, Du Roi.
On tree 10, This tree is missing.
On tree 11, Grosse Violette de Bordeaux.
On tree 12, Datte.
On tree 13, Monstrueuse.
On tree 14, Bourjassote Grise.
On tree 15, A Bois Jaspè.
On tree 16, Royal Vineyard.
On tree 17, De Grasse.
On tree 18, Euscaire Preto.
On tree 19, Trois Recoltes.
On tree 20, Monaco Bianco.
On tree 21, Bondance Precoce.
On tree 22, Trifère.
On tree 23, Green Ischia.
On tree 24, Hirta du Japon.
On tree 25, St. Johns.
On tree 26, Vebra.
On tree 27, Datte Quotidienne.
On tree 28, Arbal.
On tree 29, De Jerusalem.
On tree 30, Nebian.
On tree 31, Vigasotte Bianco.
On tree 32, Grise Savantine Bifère.
On trees 33–39, both inclusive, Missing.
On tree 40, Quarteria.
On tree 41, Reculver.
On tree 42, Douro Vebra.
On tree 43, Gouraud Rouge.
On tree 44, D'Agen.
On tree 45, Lampas.
On tree 46, Large Black Douro.
On tree 47, Adam.
On tree 48, De Constantine.
On tree 49, Biberacao.
On tree 50, Grosse Verte.
On tree 51, Violette Sepor.
On tree 52, Dr. Hoggs Clare.
On tree 53, Hardy Prolific.
On tree 54, Figue d'Or.
On tree 55, Recousse Noire.
On tree 56, Black Douro.
On tree 57, Grassale.
On tree 58, Martinique.
On tree 59, Cravé.
On tree 60, White Ischia.
On tree 61, Brown Turkey. (See Pl. VII.)

Row No. 10.

On tree 45, Pastiliere.
On tree 46, Negro Largo.
On tree 47, De la Madeleine.
On tree 48, Col di Signora Bianca.
On tree 49, Dorée Nobis.
On tree 50, Pingo de Mel.
On tree 51, Black Ischia.
On tree 52, Toulousienne.
On tree 53, Gouraud Noire.
On tree 54, Dorée.
On tree 55, Grise Savantine.
On tree 56, Brunswick.

As seen from the above names and further reference to the catalogue, nearly all these figs come from Italy, Spain, and France, and not a single one from Asia Minor. None, in fact, belongs to the race of figs which requires caprification to set fruit. This will explain why the European students of this collection of figs have failed to recognize the nature and necessity of caprification. This collection of figs, being the one used by Dr. Hogg in his well-known work on fruit culture in England, will always remain a standard collection for identification of varieties.

IMPORTATION OF BLASTOPHAGA.

The first importation of the live Blastophaga to California was made in the spring of 1891. At that time the late Mr. James Shinn received from a friend in Smyrna several small boxes with caprifigs containing live Blastophaga. As Mr. Shinn possessed at his place at Niles the largest and oldest trees of the Bulletin importation of Smyrna figs, he had naturally taken interest in the fig question. Having as a friend a missionary in Smyrna, he had requested his assistance in procuring the insects. The latter were turned loose among his Smyrna fig trees, and the insects were seen to hatch and fly about. Later, in July of the same year, another shipment of Blastophaga was received by Mr. Shinn from the same gentleman. These were turned out among the fig trees at the end of July, during a visit to Niles of Mr. E. W. Maslin and the writer. None of these insects succeeded in taking hold. There were two reasons for this, as the writer pointed out at the time. One was that the only caprifig then growing on the spot produced only a single crop a year. When the insects flew out there were no young caprifigs in which to lay eggs. The other reason was that the Blastophaga had hatched on the road and had, of course, been fertilized by the males at the time. As this had taken place some time previous, it was probable that the eggs had degenerated and become reabsorbed. All the males were dead upon the arrival of the figs, and even if they had been alive no new copulation could have taken place. During the following few years caprifigs containing Blastophaga were received from Smyrna by Mr. George Roeding and Mr. Anthony C. Denotovitch, of Fresno, Cal., but the Blastophaga always failed to take hold, for the reasons stated above. All the caprifigs imported so far had been of the second crop, or mammoni. So far no mamme had been received. Previous to this, or in 1890, during the author's visit to Washington, D. C., both Dr. C. V. Riley and Dr. L. O. Howard had taken a lively interest in the caprifig question. When Dr. Howard later on became the head of the Division of Entomology, he decided to introduce the Blastophaga to California, and, if necessary, send some one to Smyrna to secure them. He was authorized by the Hon. James Wilson, Secretary of Agriculture, to make the attempt, and in 1897 communicated with the author and asked if he would undertake the journey. In the spring of 1896 Mr. Walter T. Swingle, then studying at the Zoological Station at Naples, became interested in the problems of caprification, which had been so much investigated in that region. In 1898, during a second stay at the Zoological Station, he made more extended studies, in which he had the benefit of the advice and help of Count Solms-Laubach and Dr. Paul Mayer, the recognized authorities on the subject. During March and April he secured and sent at his own expense the first shipment of mamme caprifigs, which were packed by a new method. This was the first time the mamme generation of caprifigs had been sent to America. They reached California in April in good condition, but although the insects came out by hundreds they failed to become established. Shortly afterwards Mr. Swingle was appointed an agricultural explorer in the newly established section of Seed and Plant Introduction. Since he was on the spot and was so well fitted for the work, it was considered unnecessary to send another investigator abroad, and Mr. Swingle was instructed to continue on behalf of the Department his efforts to introduce the fig insect and suitable varieties of the caprifig tree.

Mr. Swingle studied the methods of fig culture and caprification in Algeria, Sicily, Naples, Greece, and Smyrna, and forwarded a number of mamme caprifigs from Algiers in the spring of 1899. These caprifigs arrived in good condition and were sent by the Department of Agriculture to Mr. George Roeding, of Fresno, whose large and healthy fig orchard had been selected as the best for the purpose by Dr. Howard, after a personal examination in the spring of 1898. Mr. Roeding, by the way, had also repeatedly imported the Blastophaga, but all had failed to establish themselves in the caprifigs. As a result of the last Government introduction of Blastophagae to the Roeding orchard, it is most gratifying to know that at last the fig wasps have been properly established in California, both at Fresno and at Niles, and there is now every prospect that, with proper care and with proper distribution of caprifigs in frost-free localities, these insects will become so acclimated that no more introductions will be required. In order to study the intricate problem of the relationship of the Blastophaga and the caprifig, Dr. L. O. Howard, chief entomologist of the United States Department of Agriculture, directed Mr. E. A. Schwarz to proceed to California in the spring of 1900. As a result of the investigations of Dr. Howard and Mr. Schwarz, the former has contributed to the Yearbook of the United States Department of Agriculture for 1900 a most important account of caprification in California.[1]

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[1] The article has also been reprinted in separate form, and copies of the same may be obtained upon application.

CHAPTER IV.

CAPRIFICATION OF THE FIG.[1]

Caprification of figs is a practical process based on scientific principles, which latter are as interesting and have been as badly misunderstood as those connected with the practical part of the process. From time immemorial caprification has been practiced in certain countries, and practical results have been claimed for it. As regards the practical value of caprification, there are two distinct and opposite views held by different investigators. Some claim that caprification is necessary and valuable; others hold that it is useless. As regards the scientific principles involved, there are also various views put forward, as will be explained further on, some of which are radically opposite to others. The chief reason why this question was not solved long ago has been twofold. First, many of the scientific investigators have not been practical horticulturists; while others have not been aware that they experimented on figs which really did not require caprification, and which would not be benefited by it.

Every investigator began and ended his researches with the erroneous idea that all cultivated figs were alike, and he drew his conclusions accordingly. This alone explains the indifferent results achieved so far by European investigators.

The many points involved in these interesting questions are both practical and scientific, and the two groups are so interwoven that the one can not possibly be understood without a full knowledge of the other.

I am anxious that this may be understood in the beginning, as in the following pages practical details will be found hand in hand with scientific studies. The practical cultivator who knows but little of scientific phraseology would not understand the terms unavoidably used below, unless they were properly explained. Similarly, the scientific investigator, whose interest in this subject lies principally in the process of caprification and in its supposed value or uselessness, would not properly understand the practical details connected with the horticultural crops of the figs, unless they were explained in a way that may seem too elementary to the horticultural student or practical botanist.

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[1] A more extended treatise of this subject by the author was published in the Proceedings of the California Academy of Science in 1896.

PRACTICAL CAPRIFICATION IN CALIFORNIA.

The requisites for caprification as now practiced in the State of California are genuine Smyrna fig trees, two or three varieties of caprifig trees, and colonies of *Blastophaga grossorum* or fig wasps, occupying the caprifigs.

There are two or three desirable varieties of genuine Smyrna fig trees to plant, all of which can now be had in California. They are known in that State either as Bulletin Smyrnas or as Lobfigs, the former named on account of the corporation which made the first introduction of the cuttings, the second on account of the name used in Smyrna. In the catalogue several local names of the several varieties are found and which will in time be used. The trees are planted from 40 to 50 feet apart. As soon as the figs begin to bear they may be caprificated. The trees bear the first year, but not profitably for several years. It has been found from experiment that a fully developed caprifig of the best variety will and can contain on the average some 600 Blastophaga wasps. With this as a basis for calculation we find that under favorable circumstances it will require one caprifig tree for every 50 Smyrna trees. One tree for every 100 Smyrna trees may suffice in very favorable seasons, but the greater number is safer. The caprifig trees should not be set among the Smyrna trees for several reasons. The caprifigs require sheltered places and shade; the wasps require when hatching figs of proper size in which to lay their eggs; and finally it is necessary to evenly distribute the Blastophagas when caprifying the trees, as otherwise some trees will get too many while others will get too few wasps. For these reasons the caprifig trees are set by themselves in sheltered places. It is best to have plantations of caprifig trees in places some distance from the fig orchard as well as near it.

The chances of having caprifigs in the necessary stage of development are thus enhanced. It is also advisable to plant two, three, or more varieties of caprifig trees together in a grove, in order that figs of proper size may never be wanting from one end of the year to the other. The caprifig trees are set in the form of hedges about 10 by 20 feet. The wasps prefer shade and cool places and such places must be provided for. On this account the limbs of the caprifig trees should be allowed to grow low and shade the ground. The trees should be pruned only when necessary to cut away dead limbs. In order to introduce the necessary Blastophaga wasps it is only necessary to procure caprifigs containing colonies. These caprifigs are suspended in the growing caprifig trees at a time when they carry figs of proper size to receive the wasps. This is during the months of April to October, according to locality and crop. To start a colony of Blastophaga wasps in a caprifig tree requires from one to five good caprifigs. The grower must examine his caprifig trees after the winter frosts are over, in February or March, and ascertain if the Blastophagas in the mamme-figs have stood the winter. If the mamme have remained plump and heavy the crop of wasps can probably be depended upon to issue in due time. But if all the mamme of the caprifigs have fallen during the winter, then it will be necessary to procure fresh mamme-figs from some other place and suspend them on the branches of the caprifig tree in a shaded place. The time for doing this will be, according to locality, during the latter half of March or beginning of April. The grower must be constantly examining his caprifig trees to ascertain if his colonies of wasps are in good condition. If any of the caprifig crops fail, wasps should be imported anew. It may thus be necessary to caprificate the profichi, the mammoni, and the mamme, as either of these crops may appear too late to be affected by the wasps. Hence the necessity of having caprifig trees of different varieties in various localities.

The Smyrna fig trees are caprificated in the months of June and July, according to locality. When the Smyrna figs reach the size of a hazelnut or a large filbert they are generally in condition to be caprificated. If as large as a walnut they are probably too old for the wasps to take hold. When in proper condition caprifigs are procured and strung on raphia or esparto grass, one or two figs at each end of a string. The number of caprifigs necessary to caprificate a Smyrna fig tree depends upon two things—the age of the Smyrna fig tree, or rather upon the quantity of its figs, and upon the number of wasps in the caprifig. At present there are no Smyrna fig trees in California over 20 years old. For a tree of that age, and provided it is growing in good soil and has been well cared for, from 10 to 12 caprifigs will suffice. If older, more caprifigs will be necessary, and probably in any case 50 figs will suffice. This small number of caprifigs required in this country compared to what is necessary in Asia and Africa is due either to the fact that we have imported the Blastophaga wasps without their natural parasites, or to the lesser age and consequent yield of our trees. In Asia, Africa, and Europe the Blastophagas are decimated or even to a greater extent diminished in number by parasitical wasps also infesting the caprifigs. When such is the case it is evident that more caprifigs are necessary to caprificate a certain tree. The crop used for caprification of the Smyrna figs is the profichi crop. This crop is the first crop of the caprifig—the one which appears on the old wood. The crop which the profichi caprificates is the second crop of the Smyrna fig—the crop which sets in the spring and matures the same summer.

It is of the greatest importance that no more caprifigs should be imported to the United States, as it is almost certain that they would introduce the natural enemies of the Blastophaga wasps. In caprifying the trees the caprifigs are most conveniently strung on any soft and flexible grass. This is best done in the shade under the trees or under a temporary shed or tent. The strings are hung on horizontally supported rods of cane, and these rods are carried into the field by the caprificator. In this way the figs do not become entangled. In selecting a place on which to hang the strings one that is shaded is preferable. A string is taken from the rod or cane and suspended on a branch of the Smyrna tree and given a twist so that it will not fall off. The process of caprifying the trees should be repeated several times, or as long as it is desirable to procure ripe Smyrna figs. During the first caprification one-half of the caprifigs necessary may be suspended. Ten days later the other half may be similarly suspended. Should more young Smyrna figs appear after a week or two it may be advisable to suspend a few more caprifigs in order that they too may be caprificated.

SHORT SUMMARY OF CAPRIFICATION.

Caprification is a horticultural process which consists in suspending the profichi or first-crop figs of the caprifig on the branches of the edible fig. The object of caprification is to produce seed in the edible figs and to cause these latter to set and mature. Only such profichi as contain fig wasps (*Blastophaga grossorum*) are of any value in caprification. Shortly after the profichi have been suspended the female Blastophagas hatch out of their galls, and in their efforts to leave the fig become covered with the ripe pollen of the caprifig. Once outside of the caprifig the Blastophagas search for other caprifigs in order to lay their eggs in them. But not finding any caprifigs, they enter the edible figs by mistake. The effect of this visit is the pollination of the edible-fig flowers with the caprifig pollen brought along by the wasps. The pollination again causes the edible figs of a certain class to mature seed and to set its fruit. In order that pollination may be properly accomplished, it is necessary that the figs practiced on should have female flowers in a proper state of development with receptive stigmas, and that the pollen of the caprifigs should be properly developed and in a good condition. Not all edible figs are equally susceptible of caprification. The time for caprification is in June and July, according to locality. Caprification is nothing else than an artificial pollination accomplished partly by man, who suspends the caprifigs, and partly by the wasps, which carry the pollen from the caprifig to the female flowers of the edible fig.

The same process of pollination accomplished by the wasps on the edible figs is also necessary in the caprifigs in order that they may produce ripe and fertile seeds. No caprifigs will produce seed if the wasps are not present carrying the pollen from one crop to the other. Also in the case of the caprifigs man's aid is at times required. The Blastophaga wasps breed and hatch in the wild caprifigs, hence no human aid is required to bring these figs from one tree to the other, but all cultivated caprifigs are caprified in order to insure a crop of wasps.

If the wasps could breed and live in the edible figs no caprification would be required. When through unfavorable climatic conditions the Blastophaga crop fails, when the early spring frosts kill the young wasps and their eggs and larvæ, or in the case of some varieties of cultivated caprifig trees, man's aid is required. The grower must then supply caprifigs with live wasps from some distant part and transfer them both to the caprifig trees in order to start new broods and to the edible figs in order to caprificate them. This is done at times in Asia Minor, when often after heavy frosts whole shiploads of caprifigs are imported from Greece to supply the necessary wasps. Caprifigs suitable for caprification are regularly sold in all market places in the fig-growing countries around the Mediterranean.

After this short summary of the process, caprification will be considered more in detail. A horticultural and botanical study of the fig, its flowers and crops, is required in order to fully comprehend the necessity, importance, and nature of this interesting and complicated process.

CROPS OF THE FIGS.

General remarks.—The caprifig, as well as the edible fig, bears several distinct crops every year. So distinct are these crops and so important does the distinction between them appear to those nations which depend upon fig culture as an article of food and commerce that the various crops have been given separate and characteristic names.

In order to understand these names a detailed description of the various fig crops is necessary. We must bear in mind that while the fig and the caprifig crops in a general way resemble each other, they still disagree in some important points. This may also be said to be the case with the principal types of the edible fig. In a general way it may be stated that we have three distinct crops, each one appearing at a separate time—spring, summer, and fall—according to the season in the respective countries. But each one of these crops is characterized in a peculiar way, and without a full knowledge of them a perfect understanding of caprification is impossible. (Pl. VIII.)

The various crops of the fig.—While the edible-fig tree may possess three distinct crops, we do not always find all these crops following one another on the same tree. This may be and often is the case, but fig trees and fig varieties exist in which one or more crops are wanting. The first, second, or third crops may be respectively suppressed, or one of these crops may be present while the other two are suppressed.

Shortly before the fig tree begins to leaf out in the spring, small button figs are seen pushing out from the wood of last year below the young leaves of the present season. The place where these figs develop is the place where during last season existed a leaf, which

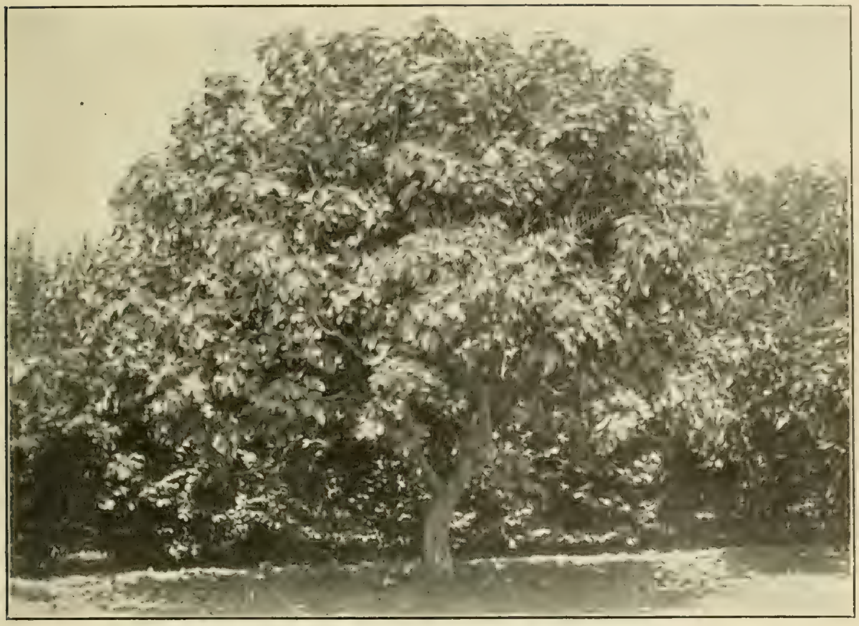

FIG. 1.—GROSSE GRISE BIFÈRE FIG TREE, JOHN ROCK ORCHARD, NILES, CAL.

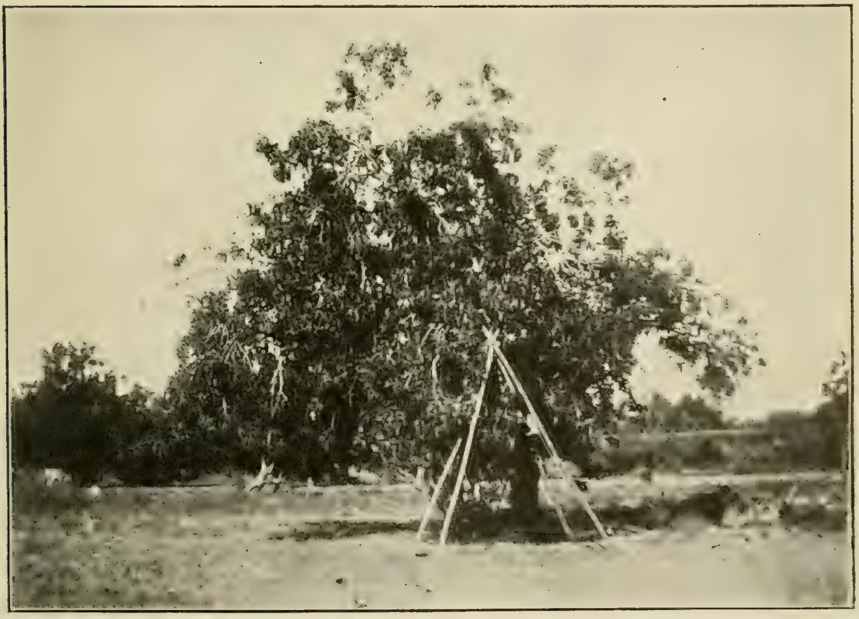

FIG. 2.—CAPRIFIG TREE, FRESNO, CAL.

fell off last fall. These figs grow rapidly and mature generally in the end of May in all southern countries or in June in more northern ones. This is the first crop of figs, also known as early figs or brebas, first figs, or summer figs. This crop of figs has not yet matured, or, in some varieties, has hardly matured, when other young figs are seen to push out from the leaf joints of the present year. In the course of a month or two these figs ripen and constitute the second or main crop. With most figs this crop ripens in August, later or earlier, according to variety. This crop is also known as second figs, autumn figs, or late figs.

A third or later crop is found in some varieties, forming in August and ripening in winter. This may be called the third crop; but this third crop is not greatly distinct from the second crop. Both develop from the leaf joints of the same season. In reality, this third crop of edible figs can only be considered as the last of the second crop. The first crop is, however, entirely distinct from the second crop, as it is produced on the old wood. Sometimes the last figs of the third crop do not fall in the autumn, but winter over and ripen early in the next spring, just as the first crop, and are thus hardly distinguishable from it.

The crops of the caprifig.—In the caprifig the three crops correspond to those of the edible fig, but, as in that fig, they are not always all present in the same tree. Thus caprifig trees exist which develop only one crop, while others possess two or three crops. The variation in crops may be confined to individual caprifigs of the same variety, or it may characterize some special variety, in which all the trees are exactly alike. The variation may also depend on the seasons.

At Niles, Cal., the crops of the caprifig succeed each other in the following manner : At the time of frost, in the fall, we find a large number of figs as large as walnuts or hazelnuts situated at the very tips of the branches. These figs began to appear as small buttons in July (1900) and continued to increase until they became of size to be caprificated in September. This crop of end-figs is known as the third crop (the mamme), and is really only the continuation of the second crop. But it differs from the second crop in its faculty to pass the winter unharmed on the trees. The following year in March these third-crop figs, or mamme, become fully mature, and the wasps which escape from them enter the first crop (the profichi).

The first crop (the profichi) began to appear as small buttons in December. They increased very slowly at first during the winter, but toward spring they became quickly larger, and in March they had reached the size in which they were caprificated. They then varied between the size of a pea and a hazelnut. In June and July, according to locality and season, these first-crop figs are fully mature, and are then used for caprification. These first-crop figs (the profichi) were situated on the old wood—the wood of the previous year. In this they differed from the second, or mammoni, which mature on the wood of the same year.

The second crop (the mammoni) began to set in June and became mature in August. It appeared as buttons on the green wood and matured while this wood was yet green. It was the only crop which did not pass the winter. The purpose of the second crop is to furnish wasps for the third crop (or mamme), which passes the winter on the trees, and to furnish seeds.

To recapitulate, we find that the first crop (or profichi) passes the winter as very minute buttons on the old wood and matures the following summer. The second crop (or mammoni) begins and matures the same season, and passes its entire existence during the summer. The third crop (or the mamme) passes the winter as large figs (hence the name), fully developed or almost fully developed, and its figs are the first of the caprifigs to mature in the spring. The third and first crops are thus both found on the old wood. The second crop alone begins and matures on the green wood.

A perfect caprifig tree must possess an overlapping of crops. If any crop should fail, it would be fatal to the wasps living in the figs, unless they had figs in other trees in which to breed.

In the best Smyrna varieties the various crops of the caprifig are confined to distinct trees, which again have received distinct names. The trees which bear the winter crop, boghadhes, are known as "orginos boghadhes," while those trees which bear the spring crop, or ashmadhes, are known as "orginos ashmadhes."

The winter crop, or the orginos boghadhes, seldom contains any male flowers and pollen. This tree may, however, have an earlier crop which bears male flowers.

The orginos ashmadhes, again, which produce the figs used for caprification, which crop is the first crop, or the ashmadhes, do, as a rule, never possess any other crop. It will therefore be seen that in order to possess a complete succession of crops of the caprifig we must either cultivate varieties which bear several crops on the same tree, or, if we grow the Smyrna "orginos," we must have both the boghadhes and the ashmadhes trees. The former breed the first crop of blastophagas; the ashmadhes again breed the second crop of blastophagas from eggs laid by the wasps hatching from the boghadhes.

As the boghadhes or winter crop and the ashmadnes or spring crop in Smyrna are often produced on different trees, it will be seen that either we must have both of these trees in the same orchard, or we must caprificate the trees bearing only one crop. The latter plan is adopted in Smyrna, where only orginos ashmadhes are cultivated. The reason of this is that comparatively few boghadhes or mamme are required for the caprification of the ashmadhes or profichi, while an enormous quantity of ashmadhes is necessary for the caprification of the edible figs. It is easier to bring in the few boghadhes required from the hills than to cultivate them. Besides, the trees bearing the boghadhes generally grow in frost-free places in the hills, the frost in the orchards being apt to kill both the figs and the wasps.

Names of the crops.—In order to avoid misunderstandings, the various crops are given distinct names in all foreign countries where fig culture is prominent. The crops of the caprifig, which not always correspond with the crops of the edible figs, are named differently. The following table will give a clearer idea of these names. As the English language has no suitable names for the various crops of the caprifig and the fig, I propose that we, for the early first crop of edible figs, adopt the Spanish name "brebas," and that we simply call the second crop of edible figs "figs," or autumn figs. For the caprifig I believe we can do no better than adopt the nomenclature of the German specialists who now use the Neapolitan names profichi, mammoni, and mamme. Dr. L. O. Howard[1] questions the existence of three distinct crops of figs. This question is not yet settled, and while it may prove botanically correct to refer to the crops as only two—figs which attain their full size on the old wood, and figs which attain their full size in the axillaries of the leaves—still it certainly is horticulturally convenient to speak of the fig crops as if they were three distinct ones, even if the three crops are not always found on the same tree.

Names of various crops of edible figs (Ficus carica L.).

	First crop (April-August).	Second crop (June-August).	Late (November).
France	Figues-fleurs or Flores.	Figues d'automne; Figues ordinaire; Figues automnales.	
Italy	Fiori. Fichi primattici Fioroni.	Pedagnuoli; Forniti	Cimaruoli.
Spain	Brebas	Higos	
Portugal	Figos lampos	Figos vendimos	
Morocco	Bukor	Karmus	
Kabylia	Ourgalen and bakour	Akerkouch	Azoubzeg, inirém.
Algiers	Boccôre	Kermez or kermouse	
Venice	Bolos		
Greece	Prodromoi, ornos	Fornites	
California	Brebas	Figs, summer figs	Autumn figs.
Latin	Grossi	Forniti	
Niçoise	Figa flou	Oustinchi	

Names of the caprifig and its various crops (Ficus carica L.).

	Caprifig tree.	First crop (October-June).	Second crop (June-August).	Third crop (July-March).
France	Caprifiguier			
Italy	Caprifico	Profichi	Mammoni	Mamme.
Spain	Caprahigo			
Portugal	Fico de toca			
Arabic Spain	Obzakar			
Greece		Orni	Fornites	Cratitires.
Kabylia	Doukkar			
Morocco	Tokkar			
Malta	Tokar	Tokar ta noss.	Tokar tayeb	Tokar seoul.
Ancient Greece				Olynthoy.
Asia Minor	Ilick, or orginos	Ashmadhes		Boghadhes.
California	Caprifig	Profichi	Mammoni	Mamme.

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[1] Smyna Fig Culture in United States.

Characteristics of the various crops of the caprifig.—In the foregoing it has already been pointed out that the various crops of the caprifig differ from one another in several respects. Here it is only necessary to generalize. The profichi form in autumn, remain on the trees over winter, and come to maturity in June and July. This crop contains many male flowers and gall flowers, but no true female flowers, as seeds have never been found in this crop. The time of maturity is June and July.

The mammoni appear in June or earlier, and mature in July and August, according to climatic conditions. They contain both male flowers and female flowers, and a large number of gall flowers. The mamme or wintering figs produce male flowers and numerous gall flowers, but no female flowers. The female flowers are thus found only in the mammoni.

The various crops of the caprifig do not always succeed each other continuously. There is frequently a lapse of time between the falling of the profichi and the appearance of the mammoni. No account has here been taken of the female caprifig tree, as yet almost unknown.

Characteristics of the crops of the edible fig.—As to the edible figs the different crops are different in size, quality, flavor, sweetness, and sometimes in color. The first crop, the fiori, figues-fleurs, figos lampas, brebas, etc., are large figs, not very sweet, but pulpy and luscious for eating fresh, and they are highly prized on that account. The different names given to these large figs indicate the value in which they are held. The difference is considered so important that, for instance, in Spain and Mexico the common people will insist that the "brebas" are not figs. In California, however, no great distinction is made as to the three crops. When fig culture becomes as important here as it now is in Europe and Asia, names may be required for the first crop of edible figs. We have already proposed for the first crop the name "brebas," now used in all Spanish-speaking countries, breba meaning early.

A large number of figs do not produce any first crop or brebas, some give very few, and others again, like the San Pedro, produce only brebas, the second crop only maturing any figs when it is caprificated.

The second crop, known in France as "figues-ordinaires," in Spain as "higos," in Portugal as "vendimos," and in English-speaking countries only as "figs," need here no special reference. It is this crop alone which is used for drying in Smyrna or in other foreign fig-growing countries, as well as in California. These figs are sweet or very sweet, and, compared with the brebas, much smaller in size. In Italy a difference is made as to the first or lowest figs of the second crop, which are called pedagnuoli or low figs, while the later or upper figs on the same branches are considered less valuable and are known as cimaruoli or top figs. In the edible figs the third crop can not be said to exist as a separate crop, as the last figs are only a continuation of the second crop. The fig tree often continues to bear until frost sets in, or until the tree becomes otherwise dormant. Some fig varieties, like the Natalino, ripen their last figs in midwinter, if properly protected.

If we compare the crops of the caprifig tree with those of the edible fig, we find that the first crop or profichi of the caprifigs correspond to the brebas of the edible figs, the mammoni of the caprifigs correspond to the second crop of the edible figs, and the mamme of the caprifigs to the winter figs of some of the edible kinds. The difference is, however, that while the mamme come to maturity the following spring, the third crop or autumn figs mature, if at all, the same year. The mamme correspond thus to the Italian cimaruoli or end figs, the location of the figs being characteristic both in the caprifig and in the edible fig. The mamme are so named on account of their large size and swollen form—resembling mammæ or breasts.

POLLINATION.

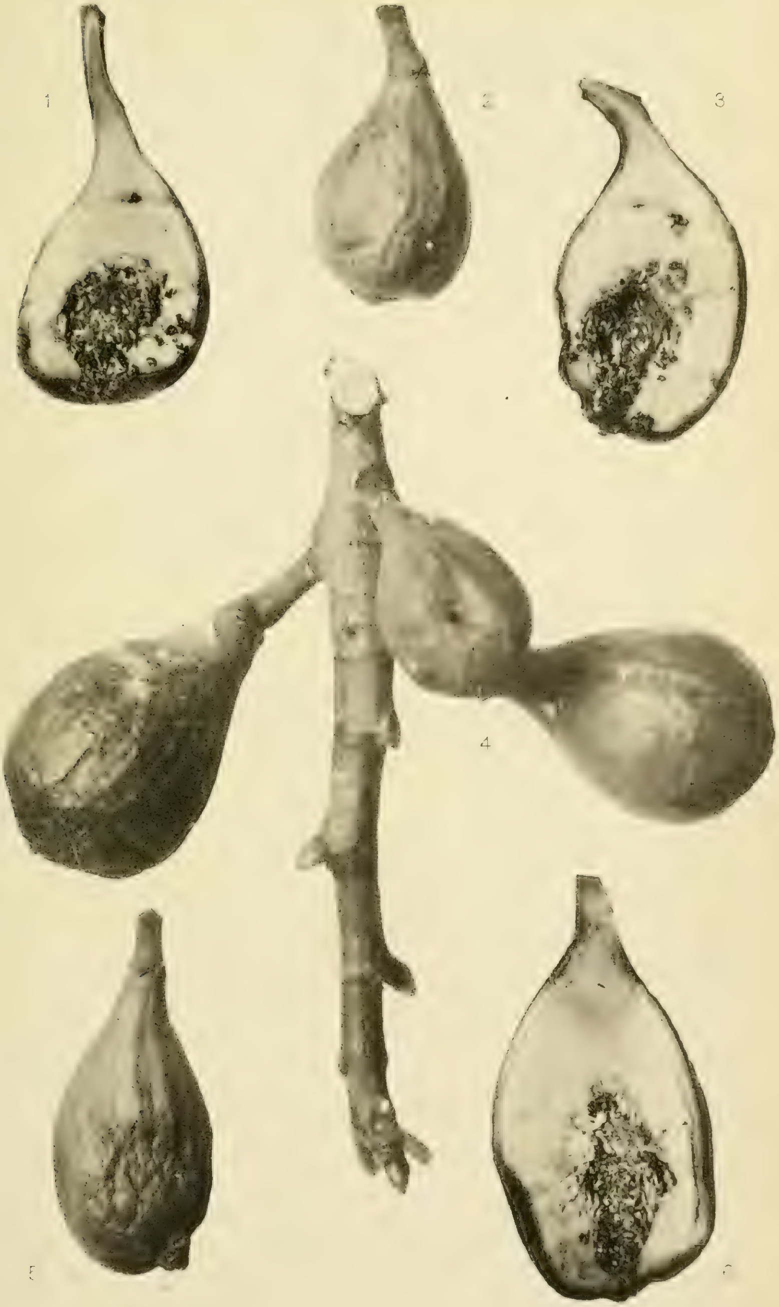
Pollination is the process in which the pollen produced by the anthers is placed on the stigma of the flowers. This process of fecundation or pollination is necessary in order that the ovary may be fertilized and produce seed. The pollen grains, when ripe, appear to the unaided eye as a fine dust, but under the microscope each grain may be seen to be beautifully and characteristically sculptured. These pollen grains are brought onto the stigma either by wind, transmitted by insects, or fall by gravity. As soon as the pollen grains are on the surface of the stigma—provided the latter is in proper receptive condition, neither too old nor too young—they begin at once to grow, sending out one or more pollen tubes, like long roots, which penetrate through the style and, following its canal, finally through the funnel-shaped opening in the ovule, reaching the inner nucellus. The fertilization has then taken place, and immediately afterwards changes take place in the ovule and nucellus, which in short time lead to the production of a fertile seed. As a rule we find that in the same flower the pollen grains and the stigma are not fully developed at one and the same time. It is therefore evident that the pollen in a flower can not be useful for fertilizing the ovary in the same flower. This is nature's remedy against self-fertilization, requiring that the pollen be brought from some other flower or from some other tree of the same kind. In the majority of flowers the pollen can be transported from one flower to another only by means of insects, and often the flowers are so peculiarly constructed that only a certain kind of insect can reach the pollen, or, rather, can reach the honey glands at the base of the anthers, as without the presence of these glands the insects would have no occasion to visit the flowers, which in such a case would remain sterile.

Nearly every flower we see in the field, and certainly every bright-colored flower, requires the visit of some insect in order that its stigma may be fertilized by the pollen which adhered to the insect when it left the last flower visited. Thus the insects and the flowers stand in close intimacy. The honey glands of the flowers furnish food for the insects, which are attracted to the flowers by their size, color, or scent, or by the odor of the honey. The insects pay for their visit and for their meal by unknowingly carrying the pollen from one flower to another—the insects are fed, the flowers pollinated. Only in very few instances do the insects live and breed in the flowers. One such instance is the fig, in which the Blastophaga wasp breeds and passes nearly its whole life. Caprification is therefore nothing but a similar pollination—one which, as regards the edible fig, is accomplished not only by the aid of insects, but also by the help of man.

Among other plants which require help in pollination in order to bear fruit or berries are certain varieties of strawberries, which possess only pistillate flowers. Such varieties will bear only when there are other kinds present to supply the pollen. In order to accomplish this pollination the horticulturist plants bisexual varieties alternately among rows of the pistillate ones. The wind and insects then carry the pollen from one variety to another, and pollination is accomplished. The flowers of the strawberry are open, and any insect almost can effect the necessary transmission of pollen. If the strawberry flowers had been hidden in a receptacle it would probably have been necessary for the horticulturist to breed and supply the proper insect. In caprification man furnishes these insects, the work consisting in bringing them from the wild figs to the cultivated ones. Another well-known process of pollination by the aid of man is the one practiced by the growers of the date palm. There are male trees and female trees of the date. The former produce only pollen-bearing flowers; the latter carry only seed or pistillate flowers. The process of pollination of the date palm consists in bringing small bunches of ripe pollen-bearing flowers to the top of the seed-bearing trees and shaking the pollen over the bunches. The staminate flowers are thus fertilized and the production of an abundant crop is assured. If this process is not undertaken by the grower, only a small crop would result, as insects and wind would fertilize only by chance and only a few flowers would bring fruit. In caprification of the fig man can not shake out the pollen on the flowers of the fig, because they are covered up. He can only suspend the pollen-bearing figs in the trees and let the Blastophaga wasps do the work of carrying the pollen through the eye of the fig to the female, or pistillate, figs. In caprification, therefore, we need not only pollen-bearing figs, but we require also an immense quantity of wasps to do the work of carrying the pollen. This complicates the process considerably, but in reality

DESCRIPTION OF PLATE IX.

Polleniferous Caprifigs from a Caprifig tree from Dalmatia, grown at Niles, Cal. Three of the Figs (figs. 1, 3, 6) are cut in order to show the floriferous cavity with male-flowers and degenerate gall-flowers. (Photograph by Dr. P. S. Bruguiere.)

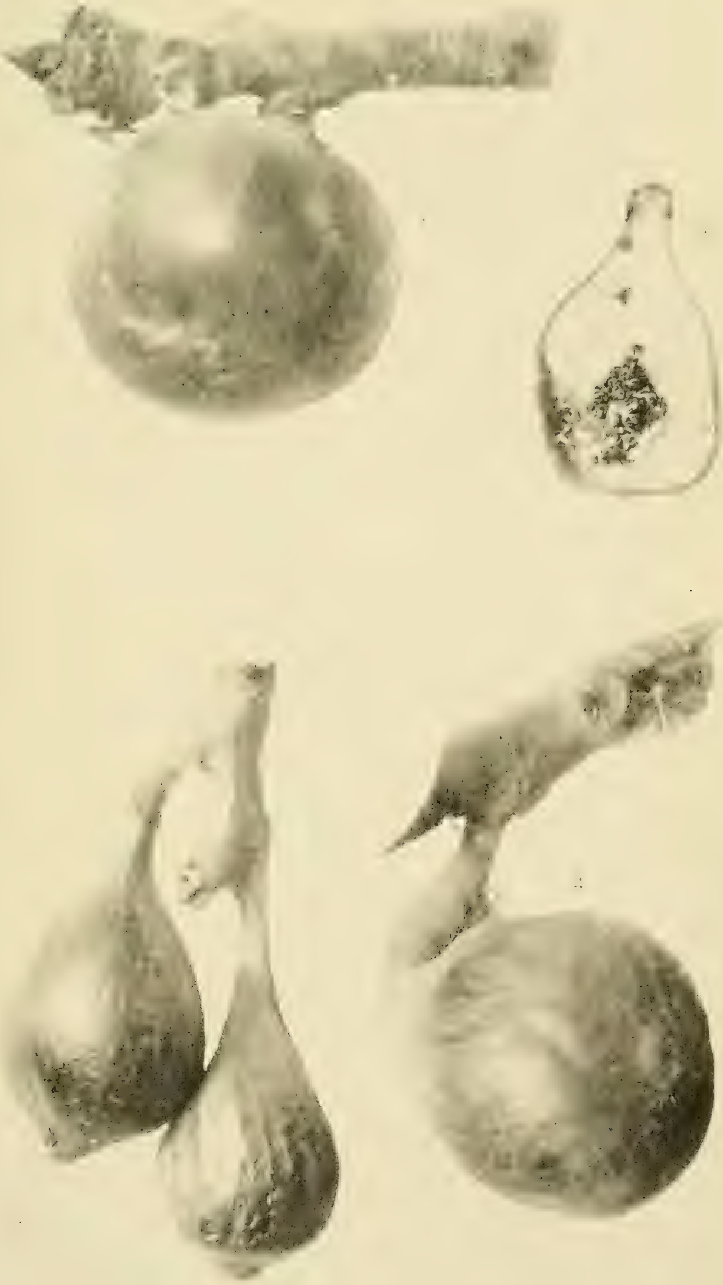


POLLENIFEROUS CAPRIFIGS: A DALMATIAN VARIETY.

HELIOTYPE CO., BOSTON.

DESCRIPTION OF PLATE X.

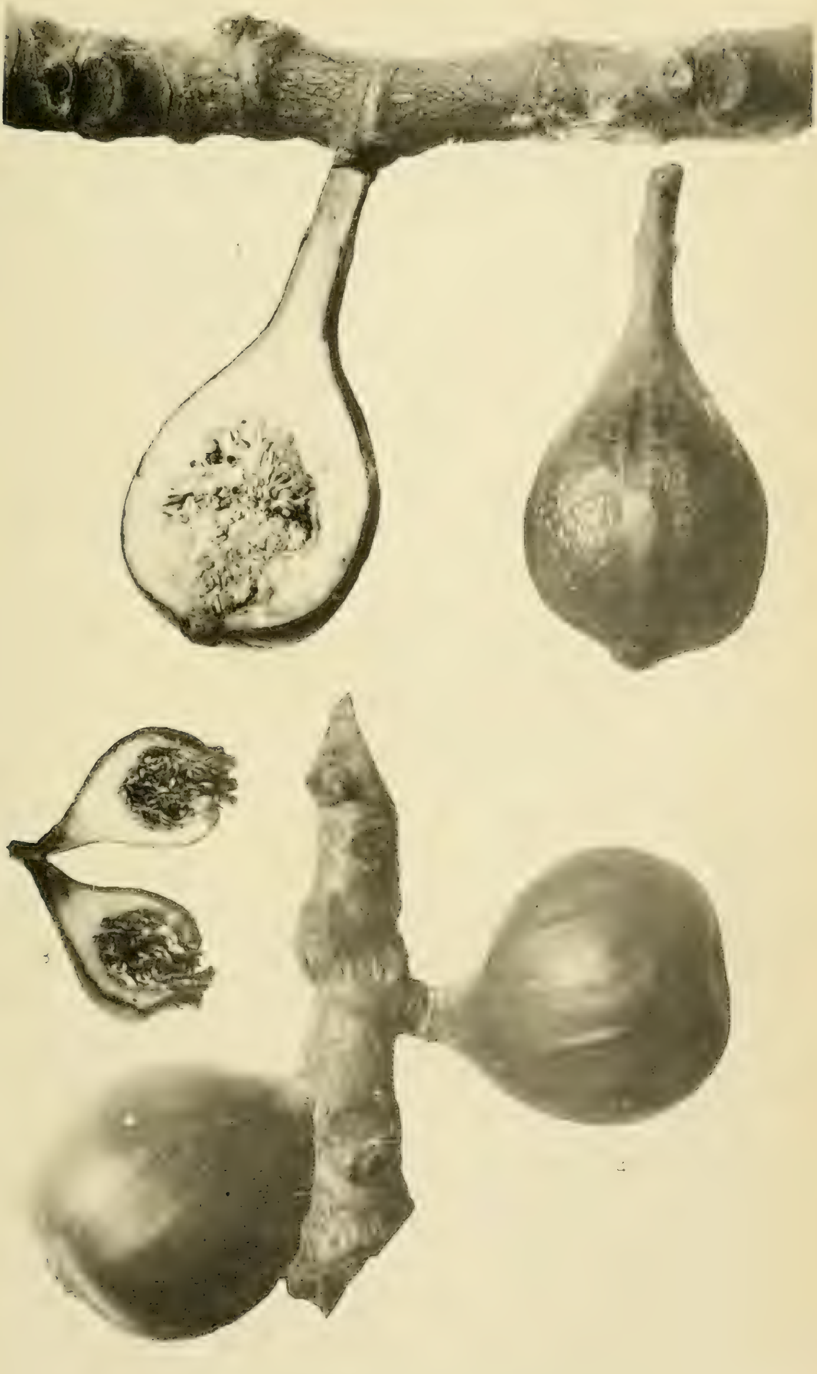
Fig. 1, an Insectiferous Caprifig, Italian variety. Fig. 2, Polleniferous Caprifig from the same tree cut in half. Fig. 3, a branch with two Polleniferous Caprifigs from the same tree as the two last ones. Fig. 4, Insectiferous Caprifig, Italian variety, different from last ones. All grown at Niles, Cal. (Photograph by Dr. P. S. Bruguiere.)



INSECTIFEROUS CAPRIFIGS: ITALIAN VARIETIES.

DESCRIPTION OF PLATE XI.

Figs. 1, 2, Caprifig branch with a cut Insectiferous Fig, Dalmatian variety. Fig. 3, a small mature Polleniferous Fig from the same tree. Fig. 4, a branch with two Insectiferous Caprifigs not quite fully developed. Italian variety, grown at Niles, Cal. (Photograph by Dr. P. S. Bruguiere.)

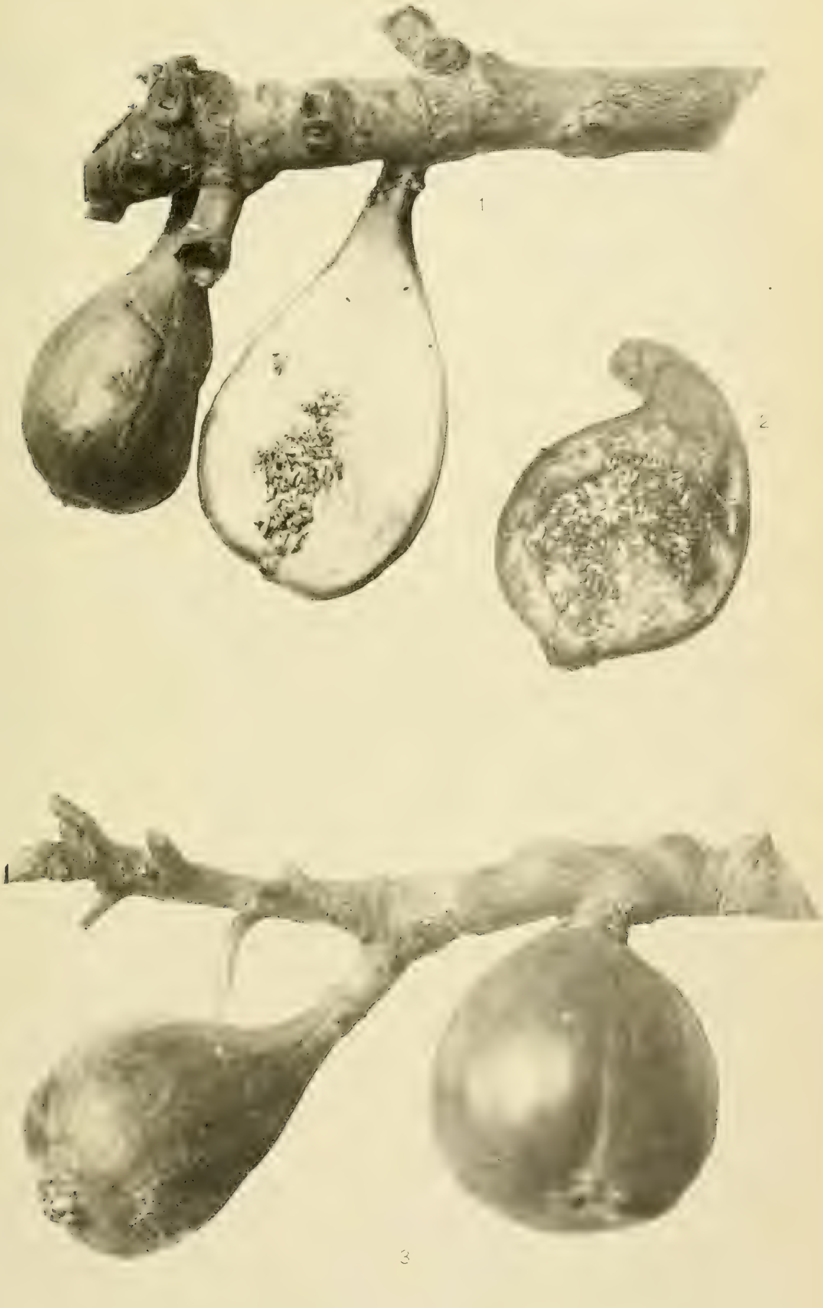


INSECTIFEROUS AND POLLENIFEROUS CAPRIFIGS: DALMATIAN AND ITALIAN VARIETIES.

HELIOTYPE CO., BOSTON.

DESCRIPTION OF PLATE XII.

Fig. 1, a branch with Polleniferous Caprifigs, Italian variety. Fig. 2, Insectiferous Caprifig, from the same tree, cut in half in order to show the zone of gall-flowers. Fig. 3, a branch with one Insectiferous Caprifig and one Polleniferous fig, Italian variety, grown at Niles, Cal. (Photograph by Dr. P. S. Bruguiere.)



POLLENIFEROUS AND INSECTIFEROUS CAPRIFIGS: ITALIAN VARIETIES.

HELIOTYPE CO., BOSTON.

its nature is the same. Every botanist understands fully the importance and nature of pollination, and we could multiply instances of its practical necessity in horticulture.

POLLENIFEROUS AND INSECTIFEROUS CAPRIFIGS OR POLLEN-BEARING AND INSECT-BEARING FIGS.

We have already stated that caprifigs require the presence of the Blastophaga wasps in order to produce seeds, but in order to produce ripe pollen-bearing figs it seems that the wasps are not necessary. A caprifig tree which is only partially caprificated possesses two distinct kinds of figs, which differ both in size and form. Mr. E. A. Schwarz, of the Division of Entomology of the Department of Agriculture, at Washington, who studied this question at Fresno during the summer of 1900, has named these respective figs, according to their nature, polleniferous and insectiferous—names which, as being eminently suitable, will probably be generally adopted. Before caprification has taken place--that is, before the new crop of wasps has entered the small caprifigs—these two kinds of figs are of the same size and form, generally the size of a large pea. But after the wasps have entered certain of the figs a difference begins to appear between those figs which have received the wasps and those which have not been entered. This difference extends not only to the figs, but to the branches bearing them. Thus all branches which bear caprificated figs start to grow more vigorously than those which do not possess caprificated figs. The latter remain puny, and even their leaves are smaller than those of the caprificated branches. (Pl. X.) A single caprificated or insectiferous fig will give character to the whole branch on which it grows. The polleniferous figs remain smaller and more oblong, and soon assume a yellow color. They become soft and appear partly mature, and soon fall off at various stages of growth, not remaining on the tree as long as the insectiferous figs. When cut open, it is found that the central floriferous cavity is comparatively small, but contains a large number of pollen-bearing flowers, which may or may not attain maturity. The meat is generally white or yellowish, and no violet-colored zone surrounds the flowers. The meat itself is soft and spongy, slightly moist, but rarely juicy. The gall flowers are shrunken and diminutive.

The twigs bearing insectiferous figs are longer, thicker, and in every way stronger. (Pls. X, XI, XII.) Each twig may contain both insectiferous and polleniferous flowers, a single one of the latter being sufficient to impart an unusual vigor to the twig. This vigor extends even to the leaves. The insectiferous fig is thicker, harder, and of a deep green. It is also more round and turbinate and sticks strongly to the twig. It has to be cut away and does not fall at the touch as the polleniferous figs do. The exterior is coarser and the ribs strongly marked. If such insectiferous fig is cut through it is found that its meat is hard and peculiarly solid and possessed of a more or less thick but always distinctly violet-colored zone immediately surrounding the flowers. The flower core is much larger than in the polleniferous figs. The male flowers are strongly developed and so is the zone bearing the gall flowers, several hundreds of which may contain Blastophagæ in some stage of development. The inhabited gall flowers are readily recognized by their plumpness and size, and when in an advanced stage of development the dark shade indicates that the wasp is near its final size and may be expected soon to issue from its confinement.

This distinction between the insectiferous and the polleniferous caprifigs is of great practical importance to the horticulturist, as it enables him to readily recognize the one kind from the other. It is only the insectiferous caprifigs which are used in caprification. The polleniferous figs which do not contain Blastophagæ are useless in caprification, and should accordingly not be suspended in the Smyrna fig trees.

The above descriptions and notes were made from caprifigs grown by Mr. John Rock at Niles, Cal.

THE FIG AND THE CAPRIFIG.

It is now generally conceded that the edible fig is in some way descended from the caprifig.[1] The caprifig is the wild fig of the Mediterranean region, though its original home must be searched for in the mountain regions of southern Arabia. From its original habitat the caprifig tree was spread by cultivation, or at least by transplantation to other districts, and finding suitable conditions, soon established itself as a wild tree in the forests and mountains of the respective countries suitable to multiplication through seedlings. It is now generally known to botanists that the caprifig carries figs which contain three distinct kinds of flowers—male, female, and gall flowers—all in the same fruit, as will be described later on. But, besides, it is also known[2] that there exists also a caprifig tree which bears mammoni which possess only pistillate and gall flowers, though trees of this kind are comparatively very rare. Cuttings taken from either one of these trees would produce only its kind, though seedlings might produce both kinds, but probably the majority of the offspring would be like the parent tree.

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[1] Both varieties are known as *Ficus carica* Linnæus, and belong to the same botanical species.

[2] Pontedera, p. 175. This female tree he calls *Erinosyce*. Gallesio also mentions such tree under the name of *Fico semi-muda*, but it is uncertain if he himself has seen it. A somewhat similar form of the caprifig is described by Solms-Laubach, p. 35, as having grown wild in a garden at Chiaja, near Naples. As all, or at least nearly all, other fig species which have been particularly described possess such an exclusively female form, it is more than likely that Pontedera's description is correct. Müller and Solms-Laubach assume that the edible fig is the female tree and the caprifig the male tree, which I can only understand to mean that the edible fig is descended from the female tree.

Through cultivation and selection by man numerous types of the caprifig tree have been originated, though they are not at present well understood or described. The Italian botanist Pontedera, and after him Gallesio, were the first to mention this fact, and although other botanists have neglected to verify and through observations enlarge upon Pontedera's and Gallesio's reports, we have no good reason to doubt that their ideas were in the main correct. Gallesio describes[1] the purely female tree of the caprifig as "*Fico semi-mula.*" In general he recognizes among the caprifig the following types:

Fico selvaggio, or common wild caprifig, with two or three crops a year.

Fico della natura, the original wild caprifig, with only one crop a year, this crop developing during the summer and ripening in the fall.[2]

Fico mostro, all caprifigs which bear no fruit or which drop all their figs while they are yet young; also trees in which only the male flowers arrive at development.

Fico mula, with female flowers, which do not develop fertile seed, and which, as he expresses himself, become pomologically but not botanically ripe.

Fico semi-mula, with no male and with only female flowers, which, when pollinated, become botanically ripe, and consequently also pomologically ripe. This fig is undoubtedly the female tree of the caprifig. From the descriptions of the other kind we may at least conclude that there exist numerous races or variations among the caprifigs.

At present we possess in California about a dozen varieties of caprifigs, differing from one another very much in the same way as do the varieties described above, as well as in other minor points, such as variations in leaves, size and color of fruit, time of maturity, number of crops, etc. Several of these varieties are necessary in every fig orchard where caprification must be practiced. The importance of growing several different varieties of caprifigs in one orchard can not be overestimated, as it will certainly be found that one variety which will be suitable in one place will be a failure in another; besides, some varieties bear only one or two crops of figs, while three crops are necessary. Home-raised seedlings should therefore be resorted to, as they are likely to produce varieties suitable to the locality where they are to be grown. The principal feature of a good caprifig orchard is that there should always be figs of a proper size to receive the wasps whenever they hatch out. If such figs are wanting the wasps will die, as they can not live for any length of time outside of the fig. There must be a crop of caprifigs for every crop of Blastophaga wasps. The female wasps are fertilized before they leave their galls in the figs, and are immediately ready to lay their eggs in young caprifigs. The failures experienced in California in establishing Blastophaga colonies on the caprifig trees growing there were partly due to lack of figs of proper size. The wasps were brought over from Asia Minor without any difficulty, but upon their arrival the caprifigs possessed only large figs, none of the size suitable for the wasps to breed in. The fact that some caprifigs do not produce any fertile seeds, although they have both perfect male and female flowers, results from the fact that, as in the edible fig the male flowers shed their pollen first long after the female flowers have passed their state of receptivity. Such caprifigs must be caprificated, just as edible figs, in order to produce seeds.

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[1] Gallesio, p. 46. Solms-Laubach doubts the correctness of these descriptions and calls them most artificial, p. 33.

[2] According to Solms-Laubach, there is absolutely no foundation for this description, p. 33.

THE FIG.

The fruit which we call a fig is really not one single fruit, but a large number of fruits (or flowers) placed on a common receptacle. The fig itself is this receptacle, and in its interior are seen the small fruits or the flowers if the fig is unripe.

If we cut open a fig lengthwise we see first, exteriorly, a fleshy, homogeneous mass, the receptacle proper, inclosing a central hollow, which connects with the outside through a narrow passage at the eye. Lining this central hollow on the inner surface of the receptacle are seen an almost innumerable quantity of small, apparently similar flowers, which are fleshy, of even size, and a little deformed, and which apparently only slightly resemble flowers with which we are generally acquainted. These are, however, the true flowers of the fig. They fill the whole interior surface of the receptacle, except close to and at the "eye," where they are replaced by scales or small leaflets, which latter interlock and form a thatched obstruction in the throat of the fig. This is generally the appearance of the fruit of the common or edible fig tree.

The wild fig or caprifig is somewhat differently constructed, a difference, however, which is of the utmost importance and interest.

In the caprifig we find, besides the scales at the eye and in the throat, not less than three different and distinct flowers covering the interior of the receptacle—male, female, and gall flowers. The male flowers occupy the place nearest below the scales of the throat, while the lower parts of the receptacle are filled with gall flowers and a few female flowers. The proportion of these flowers is different in the different crops of the figs. The hibernating "mamme" or third crop possesses male flowers and many gall flowers, but no female flowers.

The first crop or "profichi" has both male flowers and gall flowers, but no female flowers. The second crop or the "mammoni" alone possesses both female flowers and gall flowers. There are, however, exceptions to this rule, but this proportion is the most common one and is generally constant. There is also a purely female plant of the wild caprifig which possesses mammoni with only female flowers, but this plant is as yet almost unknown. It has already been mentioned that this form was first described by Pontedera.[1] The different crops of the fig will be more minutely described presently.

If we consider the fig pomologically it will be seen that, as it is principally the receptacle that is eaten, the various flowers found in the fig often detract from the value of the fig, as they are never as juicy as the receptacle part. Especially is this the case with the male flowers, which are never edible; and whenever they occur they must be cut away before eating.

THE MALE FLOWERS.

The male or staminate flowers of the caprifig are, as just stated, situated immediately below the throat of the fig, variously occupying from one-half to two-thirds of the space in the receptacle. (See fig. 9.)

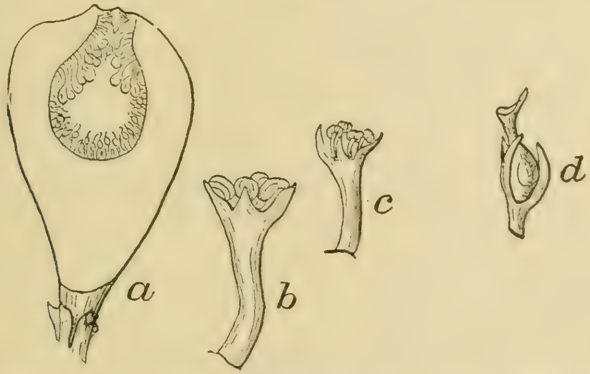

FIG. 9.—Caprifig from Smyrna growing at Niles, John Rock orchard: *a*, fig cut through from stalk to eye; *b*, *c*, male flowers; *d*, gall flower.

The flowers, though small and sometimes somewhat irregular, are still perfect. They possess four petals, generally shorter than the anthers, and shorter than those of the female flowers. Inside these petals are seen four stamens carrying larger pollen-producing or pollen-bearing anthers.

In the first crop these stamens attain their full development in the months of June or July, according to locality, or about two months after the time that the female flowers have reached their perfection in the same fig. It is evident, therefore, that in usual cases the pollen from the anthers can not fertilize or pollinate the female flowers in the same fig. Their function is to pollinate the female flowers of the succeeding crop. Thus the pollen from the first crop or "profichi" pollinates the "mammoni" or second crop, the female flowers of which are in their prime and receptive at a time when the pollen of the profichi is ripe. The pollen in the profichi is very abundant, of a pale yellow color, resembling a flowery yellow powder, which may easily be taken out and collected without injury to its vital qualities.

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[1] The female tree of the fig was first scientifically described by Solms-Laubach in species from Java. See his Die Geschlechtesdifferenzirung der Feigenbäumen.

The above refers only to the caprifig, or, if we wish to be more distinct, to the male tree of the caprifig. The edible fig, as cultivated in our orchards, does not possess any male flowers,[1] except in extremely rare cases, as will be mentioned below. (See fig. 10.)

The anthers in the male flowers are not always properly developed. This is especially the case in seedlings raised from Smyrna fig seeds, which originated from a pollination with the caprifig. Such seedlings do not all possess male flowers; those that do are more or less similar to the caprifig flowers, the anthers frequently being as well developed as in the real wild fig.[2]

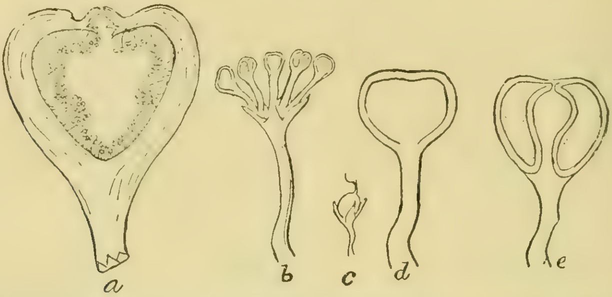

FIG. 10.—Seedling fig raised by the author from caprificated Smyrna figs: *a*, fig cut in half, showing interior cavity with male and gall flowers; *b*, male flower; *c*, gall flower; *d*, *e*, stamens with anthers.

FEMALE FLOWERS.

In the caprifig, female flowers have been found with certainty only in the second crop or mammoni. In this crop alone have fertile seeds been found, but always in very small quantities, hardly more than one fertile seed in every fig.[3] In the edible figs perfect female flowers capable of producing developed embryos are more common. Generally it has been supposed that all flowers found in the edible figs were female flowers capable of producing fertile seeds. But this is undoubtedly not the case. All flowers of the edible figs in a general way resemble the female flowers, but, as will shortly be demonstrated, they are not all alike, but differ in the various crops and in different varieties. (See figs. 11, 12.)

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[1] As will be seen in a different place, so far only a very few exceptions have been noted, among them the Cordelia fig in Solano County, Cal., and the Croisic fig, growing at the mouth of the Loire River in France. See Solms-Laubach, I, p. 14.

[2] French authors generally describe the caprifig male flowers as having only three petals, which is an error, undoubtedly originated by describing the figure in "De Breuil," where the figure of the male flower is erroneously drawn.

[3] Solms-Laubach, I, p. 11, found only twenty fertile seeds in forty caprifigs (mammoni). Gasparrini, I, p. 328.

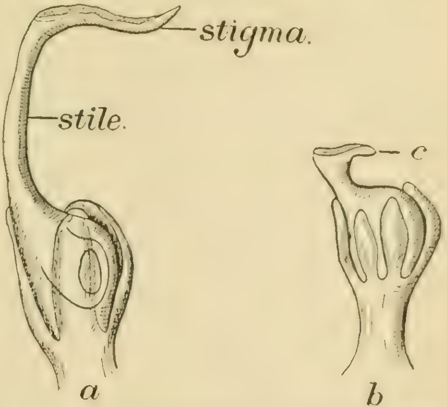

FIG. 11.—*a*, Female fig flower with perfect stigma; *b*, gall flower with imperfect and greatly shortened stigma, adapted to the use of the wasp. From caprifig.

In the second crop of the genuine Smyrna figs nearly all flowers are perfectly developed female flowers, which only require pollination in order to bring fertile seed. This appears also to be the case in San Pedro and other figs, which regularly drop their second-crop figs. As far as microscopical structure is concerned their flowers are entirely similar to those in the genuine Smyrna figs. That common edible figs possess at least some female flowers is clearly demonstrated by the finding of fertile seed in many such figs in localities where caprifigs are grown spontaneously. But the small quantity of seeds found in common figs indicates that the quantity of perfect female flowers is small.

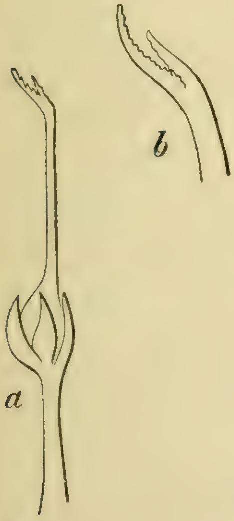

FIG. 12.—*a*, Perfect female fig flower from second crop San Pedro; *b*, its receptive stigma. The second crop of San Pedro matures only after caprification.

In places where caprifigs are not growing wild—that is, where they are not growing spontaneously from seed, it is very difficult to decide whether a flower is a true female flower or not, and the only practical way to ascertain it is to pollinate it and await the results of fertilization. A wild caprifig always indicates that pollination is taking place through the agency of wasps, as even the caprifig will not propagate itself spontaneously from seed and become wild without their agency, as the pollen can not be transferred by the wind either to the female flowers of the caprifig or the edible fig.

As regards the structure of the female flowers, some slight variation is noticeable. The petals are generally four in number, but sometimes three or five. According to Solms-Laubach, the number is quite variable within the above limits, but, according to my own observations, four is the most constant number. In size the petals vary somewhat, one pair often being a little longer than the other, and all four are always longer than the petals of the male flowers. All are more or less fleshy, and sometimes they are furnished with short hairs at the margin. In the center, between these petals, projects a single pistil, enlarged at the base, forming the ovary. The central part is elongated two or three times more than the ovary. This part is the style. The upper part of the style is bent and funnel-shaped, often, or perhaps generally, divided, one projection of the stigma being longer than the other. With a high-magnifying lens the margin and upper surface of the stigma are seen to consist of a layer of minute glands, of a warty appearance, while from the center of the stigmatic funnel there extends downward a narrow canal or lumen, which passes through the whole length of the style and down through one side of the ovary, here bending upward and touching the very embryo. When the female flowers are receptive—that is, when they are in condition to receive the pollen from the male flowers—these glands become greatly swollen and somewhat glossy, of a green or light-green color, which, after the receptive stage is passed, changes to a bright brown. The inner surface of figs in such a stage is seen to be spotted brown when cut open. The stigma attains its receptivity long before the male flowers are ripe in the same fig receptacle. This difference in the maturity of the flowers makes it impossible for the female flowers to be fertilized or pollinated by the male flowers of the same fig. Thus the female flowers of the mammoni can be pollinated only by the male flowers of the preceding crop—the profichi.

The crops of the edible figs correspond in a general way with those of the caprifig. Thus when the male flowers of the profichi are ripe, and at a time when the other flowers in this fig had passed their prime months before, the female flowers of the second-crop Smyrna figs have just attained the state of receptivity. They can therefore be pollinated by the male flowers of the profichi of the caprifigs. The time for this pollination is June or July, according to climatic conditions, in various countries. This rule as to the difference in time of ripening of the male and female flowers in the caprifig holds also good in the few instances where male flowers have been found in the edible figs. Hence the impossibility of the female flowers in our edible fig being fertilized by the pollen of the male flowers immediately above them. It is only the female flowers of the following crop that could thus be impregnated by the pollen. Female flowers occur in large numbers in the Smyrna varieties and in the first crop of such figs as the Adriatic, which do not mature this crop without caprification.

THE GALL FLOWERS.

The gall flowers, which occur in abundance in all caprifigs of all crops, are in reality nothing else than female flowers which have been transformed in order to accommodate the requirements of a small wasp—the *Blastophaga grossorum*. These gall flowers do not produce seed, though in general aspect they resemble the female flower.

The petals in the gall flowers are smaller and more unequal in size. The chief difference, however, between these flowers and the female flowers is found partly in the style of the pistil, which is not so elongated as in the female flowers, and partly in the stigma, which is very much smaller and entirely wanting the glands on its upper surface. The gall flowers can not be pollinated, or, if they are, the pollen does not develop pollen tubes, nor does the embryo or egg in the lower parts or ovary become fertile. A comparison of the figures of the gall flowers and female flowers will show the points of difference and resemblance. (See figs. 13 and 15.)

While it is true that the gall flowers do not produce seed, it is a fact that they develop to a certain extent if punctured by the wasp, or, more correctly, if the egg of the Blastophaga wasp has been properly deposited. They then develop into galls—that is, the lower part of the stigma swells up and the integuments of the embryo sac harden, forming a glossy and brittle covering as a protection for the larvæ of the wasp.

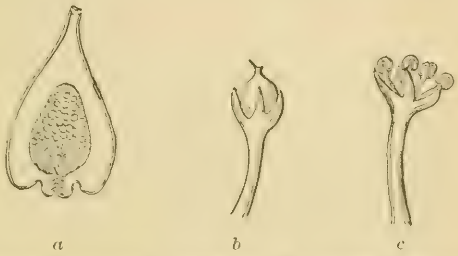

Fig. 13.—Seedling from seed of imported Smyrna figs raised by E. W. Maslin, cut May 15, 1893: *a*, longitudinal section of fig; *b*, gall flower; *c*, male flower.

Those gall flowers which are not thus wounded by the Blastophaga egg do not develop any further, but at once wither and shrink up. Gall flowers are found in all wild-fig species, though in some species their nature is not apparent until the egg of the Blastophaga has been laid. In the edible fig no gall flowers have been found with certainty; at least the Blastophaga wasp, for whose special benefit these gall flowers seem to have originated, has never been found breeding in the edible figs. It has been supposed that the cause of this was to be found in the sugary juices of the edible fig, which killed the eggs or embryo of the wasps, but I am satisfied that this is not exactly true. Many varieties of wild-fig species produce very sweet fruits, edible and quite palatable, and still these figs serve as homes for Blastophagas. The cause of the inability of the wasp to breed in common figs must be sought for elsewhere, and, as I will presently point out, is due to the fact that the edible figs contain only flowers modified to such an extent that they are unsuitable as breeding places for the wasps.

The gall flowers are characterized by a much shorter style, by an undeveloped stigma devoid of receptive glands, and by an imperfect embryo which never develops to more than a certain limited degree. The discovery of the distinction between gall flowers and female flowers is due to Solms-Laubach.

Until his researches were made known it was supposed that the female flowers turned into galls when stung by the wasps. He again proved that the distinction existed independent of the wasps, which, however, select the peculiar gall flowers as the only ones suitable to receive their eggs.

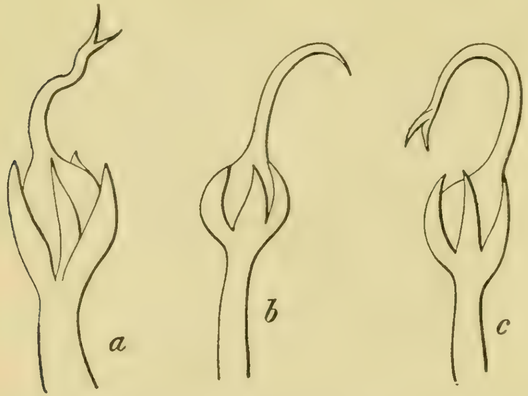

FIG. 14.—Mule flowers from the first crop, San Pedro. This crop matures without caprification.

MULE FLOWERS.

Under this name I arrange the majority of the flowers of that class of edible-fig varieties which mature their figs regularly without the presence of the caprifig and its pollen. These flowers are, as far as I know, not found in the caprifig, nor in any other wild-fig species. They are undoubtedly a product of culture and must be considered either as modified gall flowers (figs. 14, 15), which, bereft of the Blastophaga influence, have partially regained their original structure, but which, just on that account, have lost the capability of producing galls; or they may be considered as degenerated female flowers which have lost their fecundity by inertion—in other words, by not being pollinated for ages, so to say—in the same way that many cultivated flowers have degenerated. I am inclined to consider the latter as the more probable, though at present no direct proof can be given. That the great majority of the flowers in our edible figs (except the Smyrna race) are different from the true female flowers, both in structure and nature, is undoubted, whether we assign as a cause one or the other of the above theories. These mule flowers never reach any botanical maturity, and

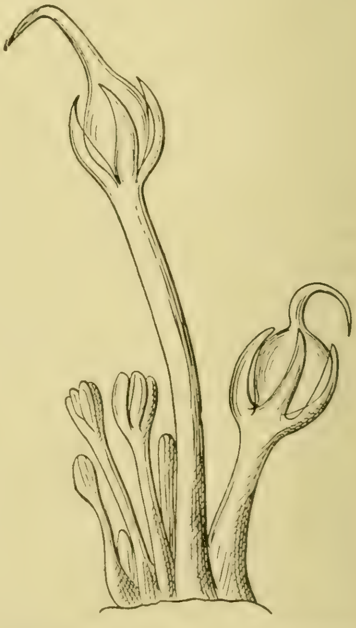

FIG. 15.—Five undeveloped mule flowers and two developed mule flowers from the second crop of Adriatic figs. This crop develops without caprification.

are really something halfway between the true female flower and the true gall flower.

The mule flowers are characterized by an imperfect stigma, by a style in length intermediate between that of the gall flower and the female flower, by an imperfect embryo, and by the property of becoming fleshy, sweet, and edible without pollination. I have so far not found any in the Smyrna figs, comparatively few in the second crop of the San Pedro class, but almost exclusively occurring in the first crop of this class. The stigma of the mule flowers has no developed glands on its upper surface and is not receptive.

MALE FLOWERS IN EDIBLE FIGS.

It has frequently been stated that male flowers are not found in edible figs, and this must be considered as a rule. However, there are some exceptions to this rule, and as they are of great interest, if not to the grower at least to the student, it may be proper to mention the subject somewhat more in detail.

The male flower of the fig was for a long time unknown to botanists, and, strangely enough, it was first described from specimens found in the edible fig. The male flower of the fig was first described by the prominent botanist La Hire, in the year 1714, from figs grown in Paris either under glass or in the open ground.[1] Unfortunately, La Hire does not give particulars as to the variety from which the flowers were taken, and it is not even certain that La Hire got his flowers from the edible fig. Another variety of edible fig which regularly produces seed is the "Croisic," cultivated in the vicinity of the ocean bathing place Croisic, on the coast of Brittany, in the department of Loire Inferieure. This fig has been mentioned by Solms-Laubach,[2] and described as being green when ripe, with white or pale pulp, very juicy and sweet, but with poor aroma. The male flowers occupy the same place and distribution as in the profichi of the caprifig. The place they occupy on the receptacle ripens less perfectly than the balance of the fig, and remains always somewhat hard and dry, generally to such an extent that it becomes necessary to remove that part of the fig before eating.

Another somewhat similar edible fig was observed by the same author as cultivated at Cherbourg, in France; also on the Atlantic coast. The male flowers in this fig were, however, degenerated or improperly developed. The finder of these figs believes them to be only highly developed caprifigs which have become edible. He is even tempted to trace their introduction to France to the time when the Phœnician traders extended their ocean voyages to the northern coast of France—a time when supposedly the common edible figs were yet in a semiwild or undeveloped condition.

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[1] La Hire, p. 287. But Colin Milne was the first one to point out that the cultivated figs contained no male flowers—only what he supposed to be female flowers. (1770.) See Milne's dictionary, article "Caprification."

[2] Solms-Laubach, I, p. 14.

THE CORDELIA FIG AND THE ERINOCYCE.

The only certain instance of male flowers having been found in an edible fig in California is that which I am about to mention.

In July, 1893, I found a box of figs in the market of San Francisco, marked as having come from Cordelia, in Solano County, containing very large yellow figs, a size larger than our largest Adriatic. Upon opening these figs I found every one with a fully developed zone of male flowers, fully ripe, and with an abundant, perfectly developed pollen. In other respects the figs resembled very much the Italian Gentile, which is now also growing in California in various localities. These figs belonged to a distinct variety and were propagated as table figs, though the dry zone of male flowers greatly detracted from the quality of the fig. The fig was juicy and very sweet. It is not impossible that this fig is identical with the Croisic fig described by Solms-Laubach, and that it was brought here by settlers from Croisic, in France.

It may be stated that both myself and Mr. E. W. Maslin, of California, have raised seedlings of Smyrna figs. Some of those raised by the latter came to partial maturity at least, and contained male flowers in greater or lesser abundance. Such figs, however, must be considered as improved caprifigs—improved by being raised from seed of Smyrna figs. The Cordelia and Croisic figs are probably descendants from the male caprifig, having retained the male flowers, while they also have developed sweetness and juiciness to a greater degree than their wild parents. It is hardly to be expected that these figs will develop perfect seeds without the aid of the Blastophaga, as it is probable that they, as other figs, will bring their male and female flowers to perfection at widely different times; in other words, that when their female flowers will be receptive their male flowers will not yet have developed their pollen.

It must be clearly understood that edible figs possessing male flowers are inferior to those which do not possess any, and the presence of male flowers is without any value from a horticultural point of view. The Blastophaga can not live in those figs, because they do not possess perfect gall flowers; the pollen can not be utilized for pollination or caprification, because there is no practical way of getting it out of the fig and onto the flowers of the next crop; and finally, such figs are inferior for eating, as the male zone is dry and not eatable.

The fig known as Erinocyce is of great scientific interest, though not horticulturally valuable. Pontedera was the first to describe and name this rare variety. It is characterized as standing halfway between the caprifig and the edible fig. Its first crop possesses male flowers as well as gall flowers with inquilines or wasps. This crop is not edible. The second crop contains perfect female flowers. Solms-Laubach, who has had opportunity to observe the mammoni or second crop of this fig, states that the mammoni possessed both female flowers with perfect embryos and gall flowers with wasps. This fig does not seem to be related to the Croisic or Cordelia figs.

In the caprifig we have three kinds of flowers: Male flowers, which, on account of the time of ripening of the pollen, can pollinate only female flowers of the succeeding crop; female flowers, which produce seed, but which, on account of the early time at which they are receptive, can be pollinated only by the pollen of the preceding crop; gall flowers, which resemble the female flowers, but which are at no time receptive, and which serve no other purpose than breeding places for the Blastophaga wasp. The female flowers of the caprifig are found only in the second crop or mammoni. The object of this restriction of nature is due to the fact that it is this crop alone which falls to the ground at a time when, on account of climatic conditions, seeds could germinate. The profichi as well as the mamme fall during the dry season, when no seeds would find the proper moisture to germinate.

VARIOUS KINDS OF MATURITY.

In the fig we can distinguish between botanical and pomological maturity. Gallesio was the first one to make the distinction, which is here adopted, somewhat modified, as being of particular use in demonstrating the nature of the fig. We find that some or most edible-fig varieties set and mature their figs without pollination, but that, as a consequence, such figs contain no perfect flowers with fertile embryos. This state of maturity may be called pomological maturity, as it does not necessarily require the botanical perfection of the flowers. Pomological maturity is attained by the great majority of edible figs, and is probably an inheritance from the caprifig, which becomes similarly pomologically mature. This pomological maturity is not necessarily accompanied by any botanical maturity, as, for instance, is proven by our California figs, which never contain any fertile seed unless caprificated.[1]

The other kind of maturity may be called botanical maturity, as it requires the flowers to be perfectly developed, with perfect embryos, in order that the fruit may set and become also pomologically mature. If the fruit is edible or cultivated as a fruit, the pomological maturity will always be effected by the botanical maturity. The Smyrna figs can only attain pomological maturity by first being botanically mature. But nearly all other figs become pomologically ripe without necessarily or generally being botanically ripe. Other figs again, like the San Pedro, produce a pomologically ripe first crop, but the second crop, which possesses perfect female flowers, does not become pomologically ripe, and can become botanically ripe only by pollination.

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[1] The fact that one tree has been found which produces male flowers, and according to the finder also seed, does not in the least detract from this theory. The Cordelia fig, as well as the Croisic fig, must be considered as a modified caprifig which has not yet lost its male flowers.

The pomological maturity usually indicates and implies a long-continued cultivation of the fruit by man, and relates chiefly to cultivated fruits. Among other fruits besides the fig which attain pomological maturity without botanical maturity at the same time we may mention some varieties of dates, one variety of pomegranate, the seedless orange, many apples and pears, the common edible banana, the pepino solanum of Central and South America, seedless grapes, and a number of other fruits and vegetables in which the seeds are abortive and have become so partly through the continued asexual propagations of the plant and partly from other causes. Botanical maturity is attained by all fruits which produce perfect seed, and if the fruit is edible it is also pomologically mature.

But it must be remembered that the fruits here enumerated as attaining pomological maturity are in general such as have been developed from pollinated flowers. Few other fruits than the fig are known to develop without previous pollination. The development of the common edible-fig receptacle must therefore be considered somewhat in the same light as the maturity and development reached by a tuber, or by the stems of the sugar cane, etc. Pomological maturity merely indicates that the fruit becomes edible, while botanical maturity means that the fruit has developed fertile seeds.

SEEDS IN SMYRNA FIGS.

We have already several times referred to the fact that all edible figs may be divided into two distinct classes or types—one which when ripe does not necessarily contain fertile seeds and one which can not become ripe without also containing fertile seeds, as otherwise it would not be ripe or mature. There are also other differences. The Smyrna figs belong to the latter class, and they always contain ripe and fertile seeds.

But as the cultivated Smyrna fig never contains any male flowers, and as caprification with the wild fig is always resorted to in order to cause the figs to mature, it is evident that the seeds thus produced must, when growing, give us hybrid plants—plants which more or less partake of both parents, the wild as well as the Smyrna fig.

Artificial pollination of figs is no new or remarkable discovery. Gasparrini relates how[1] he repeatedly introduced the pollen of the caprifig into edible figs, especially of the Lardaro variety. But his pollination produced no decided results. No increase in the number of fertile seeds was noticed, either because the flowers of the Lardaro variety were principally mule flowers, on which the pollen could have no effect, or because the female flowers had all been previously pollinated. From this Gasparrini draws the illogical conclusion, repeatedly quoted by later writers, that the caprifig is of a species different from the edible fig; that its pollen can not influence or fecundate the female flowers of the edible fig, and that consequently the practice of caprification is illusionary and of no value whatever. Gasparrini did not know of the class of figs which I have designated as the Smyrna type, and which, unlike any other class, produces principally receptive female flowers, which do not produce seed without the aid of pollen from the caprifig. Had Gasparrini had opportunity to extend his interesting and minute investigations to this class of figs, the conclusions to which he came would no doubt have been greatly modified.

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[1] Gasparrini, l. c., under point No. 8. He says he impregnated artificially thirty flower heads on a Lardaro fig by introducing into the aperture the pollen of the caprifig. In California this experiment was first tried in 1890 by Mr. G. C. Roeding.

SMYRNA FIGS IN CALIFORNIA.

The history of the Smyrna figs in California is intensely interesting, and directly bearing upon this point of the production of fertile seeds. Imported in 1880 (for details see the historical part) and quite extensively propagated and planted in the most dissimilar parts of California, these figs failed to bear a single ripe fruit during a period of ten years. The fruit would form in abundance, the flowers would develop and become apparently receptive, as shown by the glands of the stigma and the length of the style, but the fruit would invariably fall when apparently one-third or one-half grown. It was this fact, together with my observation that imported Smyrna figs always possessed numerous fertile seeds, while such were never found in our other edible figs, that made me a strong advocate of caprification, and which satisfied me that pollination was necessary and not illusionary, as almost everyone else[1] believed, principally on the testimony of Gasparrini and Olivier. It would indeed have been strange that Smyrna figs should not ripen their fruit in California, if the maturing depended only on climatic conditions or differences in soil. These figs, consisting of three distinct varieties, were planted in the most dissimilar localities and in greatly different soils, and exposed to varied climatic conditions found in the northern, central, and southern parts of California, in the interior valleys, in the foothills, and on the coast. All the Old World fig districts together would hardly show more variations in climatic and other conditions than did the various localities in which the Smyrna figs were tried in this

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[1] As is customary with unpopular theories, the first remarks on caprification in California were simply sneered at, and at the best considered illusionary, and heated discussions were entered into.

State. Still not one tree properly matured a single fruit. A few of the first crop became half ripened—that is, became yellow and soft, but insipid, not sweet, and never attained a proper size or a size at all approaching that of the imported dried figs.

Acting on the principle that the want of success in producing Smyrna figs here was due entirely to the absence of Blastophaga wasps and to want of pollination, the writer began experiments in this direction in 1882 and was later joined in them by E. W. Maslin, of San Francisco. Some of these experiments are recorded in the author's Biological Studies on Figs, Caprifigs, and Caprification, published in the Proceedings of the California Academy of Sciences, 1895, and for particulars reference may be made to that work. It is enough to state here that there were produced numerous fully mature and perfect Smyrna figs on the imported Smyrna trees by simply introducing the pollen into the figs at a time when the pistillate flowers were fully receptive. Thus, once for all, was settled the question of the necessity and nature of caprification, and it was demonstrated that the want of success in producing Smyrna figs in California was alone due to the want of pollination by Blastophaga wasps. The author's experiments also demonstrated that the varieties of the first importation of Smyrna figs into California, the genuineness of which had been doubted by nearly everyone, were genuine. This collection, consisting of several hundred trees, was brought here by G. P. Rixford in 1880 and 1882, through the aid of Consul E. J. Smithers in Smyrna. On account of the persistent dropping of the figs the idea originated by the late Dr. Stillman became prevalent that these figs were not what they pretended to be, but simply wild figs sent us by the jealous Smyrna growers, who were afraid that our fig production would come into competition with their own products. On that account most of the "Bulletin"[1] figs were rooted out.

During the year 1900 the chief of the Entomological Division of the United States Department of Agriculture, Dr. L. O. Howard, sent one of his assistants, Mr. E. A. Schwarz, to Fresno and Niles, Cal., to pursue studies in connection with caprification. During his investigations Mr. Schwarz caprificated several thousand Smyrna fig trees in the Roeding orchard near Fresno. The result was that some 6 tons of dried figs of the true Smyrna varieties were produced. These figs were all of very good quality and possessed the characteristics of the Smyrna figs. This year I am informed that some 30,000 caprifigs have been used for caprification on the same place, and a much larger crop may be expected. The time for caprification in the central part of the San Joaquin Valley is in the middle of June, while at Niles, near San Francisco Bay, the time for caprification is in July. There exist now in California some five or six different varieties of the genuine Smyrna figs and some nineteen different kinds of caprifigs. During the last season many thousand genuine Smyrna figs have been planted all over the State, and we may expect that in five or six years from now the harvest of figs of the Smyrna varieties will be considerably increased. In the meantime improvements are constantly being made in handling and curing the common figs for market.

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[1] So called because they were distributed to the subscribers of the San Francisco Bulletin, an evening daily paper, which, during Mr. G. P. Rixford's management, did much for horticulture in California.

The Blastophaga wasps are now apparently well established in this country. They wintered safely in the mamme figs both at Niles and at Fresno. At Niles the temperature fell as low as 22° Fahrenheit, but no harm was done to the fig insects. At Niles only one variety carried its mamme over winter. The other varieties of caprifigs dropped their mamme figs after the first fall frost. This may have been due to the immature age or the nature of the trees. It shows, however, the necessity of planting a number of different kinds of caprifigs in order to have a succession of crops and a constant supply of caprifigs both winter and summer.

SEEDS IN THE COMMON EDIBLE, NOT CAPRIFICATED FIGS.

As common figs I arrange, as has already been stated, all fig varieties with only or principally mule flowers, which set and mature their figs without the aid of pollen. If the seeds of such figs are examined under the microscope it will at once be seen that they are seeds only in appearance, but not in reality. They are mere glossy hulls of a yellow or brown color, with no kernel and embryo capable of development. Even without the aid of a microscope this may be ascertained by crushing the seeds with the point of a knife. The shell will then be seen to collapse, the interior being absolutely without any kernel. Although I have examined many thousands of figs grown in California during the past ten years or more, I have failed to find a single seed properly developed. I at first attributed this to the former total absence of caprifigs in this State. I now believe it to be due in equal degree to the absence, or scarcity, of female receptive flowers in our figs, generally speaking. This observation in regard to the absence of seeds in common figs has been repeatedly made in Europe.

The conclusion which I draw from the above and other investigations in regard to the perfect and fertile seeds found in our common edible figs, which produce fruit without pollination, are as follows: Figs with only mule flowers do not generally produce seed with fertile embryos. Their so-called seeds are mere shells without kernel. When this class of figs is found to contain seeds with developed embryo, it is to be explained by the presence of perfect female flowers, which again have been brought to development by the introduction of pollen, either by the Blastophaga wasps or by some other means. Some fig varieties of this class contain many female flowers.

Parthenogenesis, or seed development without pollen, has been supposed to exist in at least one tropical fig (*Ficus roxburghii*); here, however, only by excitement caused by the sting of a Blastophaga, without pollination. That this is not the process of seed production in the Smyrna tribe of our edible fig is absolutely and conclusively proven by the experiments of Mr. E. W. Maslin and myself. We produced seedlings from Smyrna fig seeds which all, when arriving at bearing age, proved to be hybrids between the edible Smyrna and the wild caprifig. This hybridization could of course not possibly have taken place except by the introduction of pollen to the female flowers. If their seeds had developed by parthenogenesis the seedlings would not have been hybrids, but would have been varieties of the Smyrna fig. The seeds were taken from imported Smyrna figs, which had been caprificated in Aidin.

DIFFERENT TYPES OF EDIBLE FIGS.

We can distinguish a number of distinct classes or types of figs which differ from one another in several very important points. Of these types there are at least six which are well characterized.

Common figs, Mission figs, or first type.—The common edible figs, which produce both ripe brebas (first crop) and second-crop figs (receptacles) without caprification or pollination. This type becomes pomologically mature, but rarely botanically mature. Its flowers are mainly mule flowers and a few female flowers, but no perfect gall flowers and no male flowers. This class includes nearly all of our common edible figs in Europe and California and all those propagated in hothouses. This class of figs bears several crops, but there is no great or important difference either in the receptacle or in the flowers of the respective crops. Some, or possibly all, of the fig varieties belonging to this type produce some fertile seeds when pollinated or caprificated. For this type I propose the name Mission figs as a suitable name, because the principal and best-known representative of this class is known in this country as the Mission fig.

Smyrna figs, or second type.—This type or group comprises the Smyrna figs and is characterized by its flowers, which are female only, perfectly developed. They produce fruit only when pollinated or caprificated. They have no mule flowers, no gall flowers, and no male flowers. The fruit becomes botanically ripe, and as a consequence of the botanical maturity the receptacle becomes also pomologically ripe. This is a purely female type, all the flowers being perfectly developed female flowers. This type of figs is at present confined chiefly to the Smyrna district, being there the only fig cultivated for commercial purposes. In the other Mediterranean districts this type of figs is rare or unknown. Introduced to California, it never produced fruit until pollinated.

San Pedro figs, or third type.—This is the San Pedro type, with different flowers in the different crops. The first crop or "fiori" contains only mule flowers. This crop becomes consequently pomologically ripe without pollination or caprification, and it is questionable if it will ever become botanically ripe or produce seeds, even if caprificated.

The second crop contains only fully developed female flowers which require pollination in order to set fruit or become botanically mature, the receptacle never becoming pomologically mature as long as the flowers are not pollinated.

To this class belongs a limited number of figs, which are especially valuable on account of their "brebas" or first crop. Among varieties belonging to this crop are the San Pedro (yellow), the Gentile, the Bitontoni, the Portuguese, and a few others.

Adriatic figs, or fourth type.—This type contains figs which do not mature brebas, or first crop, without caprification or pollination. Except under the latter condition this first crop always drops. When pollinated or caprificated again the crop sets and matures. The certainty of this fact is due to experiments made lately by Mr. John C. Jones, who caprificated at Niles an Adriatic fig tree in April last. This tree is the only one out of many which has set a crop of brebas, all others having dropped theirs. On cutting open these caprificated brebas we find that they contain perfectly developed seeds. The second crop of this type of figs does not require caprification in order to reach pomological maturity. To this class belong a very large number of figs which have until now been cultivated only for their second crop. The second crop contains many female flowers.

Cordelia figs, or fifth type.—To this type belong all figs which, like the Cordelia, Croisic, and others, possess edible figs with male flowers.

Erinocyce figs, or sixth type.—To this type belongs the Erinocyce fig previously described. It possesses male flowers and gall flowers in the first crop and female flowers and gall flowers in the second crop. The first crop is not edible. To what extent the Erinocyce and the Cordelia type combine is not known.

Origin of the types.—The origin of these various types I derive from the various crops of the caprifig, through artificial or horticultural selection. The first type may have descended from the male tree of the caprifig, through elimination of the male flowers. The gall flowers in not being used for galls would naturally endeavor to regain their female nature, while the female flowers, by now and then being pollinated, would more or less retain their female or seed-producing nature. This theory was first suggested by me in a letter to Professor Solms-Laubach, who, however, thinks that the origin of this class may be equally well explained by supposing their descent from the female caprifig, in which case the female flowers, through nonuse, have become degenerated. But the fact that this class contains both mule flowers and perfect female flowers speaks, I think, in favor of my theory that the mule flowers are in reality only degenerated gall flowers, or perhaps more correctly gall flowers which through nonuse are regaining their female nature. If descended from the female tree of the caprifig there is nothing to explain why some of the flowers are capable of producing seed while others are not.

The second type, or Smyrna figs, must have descended directly from the female tree of the caprifig, their flowers having retained their female nature through constant caprification.

The third and fourth classes are more difficult to explain. They have probably descended from a cross between a female Smyrna and a caprifig.

The fifth class is nothing else than a direct descendant from the male caprifig. It retains its male flowers, they having not yet been eliminated, while the pomological maturity is simply an improved botanical maturity of the caprifig, as it is well known that several varieties of caprifigs are edible, though inferior in quality.

How this cultural evolution and development could have taken place is not difficult to understand. The efforts of man to cultivate and propagate only the best or what proves most suited to his purposes have caused him to gradually discard, first all inferior trees, later all inferior varieties, all which either did not suit his taste or which in other respects did not prove as profitable as others. This progress in selecting varieties has been continued to our own day with nearly all kinds of fruit, progressing more or less rapidly, according to the intelligence and civilization of the cultivators. As the fig is one of the oldest of fruits mentioned in the history of the human race, the selection and improvement of varieties must have taken place at an early date; in fact, at the dawn of higher civilization. No barbarous people could evolve the luscious edible fig from the insignificant and worthless caprifig, even if we suppose that some chance seedling of the female type with superior fruits had been found. The likelihood that caprification was invented simultaneously with the cultivation of the first edible fig makes it more probable that the civilization of the people in question was considerable. The origin of the edible fig of the Smyrna kind must be traced to some one of those ancient nations of the valleys of the Euphrates and Tigris whose history and remains archæologists are now beginning to unravel.

It is possible that the Smyrna race of figs was first originated and that later the other class of edible figs was evolved. Or it may be that both originated simultaneously, or nearly so, in separate countries. The truth and facts of this we will probably never know, and our assertions can only have the value of more or less probable conjectures.

The first figs of either class must have been very inferior to those now considered our best. The class which descended from seeds of the male caprifig must, to begin with, have possessed some male flowers in at least one of its crops. The first effort in selection must have been to eliminate these male flowers, as both they and the part of the receptacle on which they grow are hard, dry, and otherwise not palatable. Thus in the Croisic fig the male flowers, together with their part of the receptacle, is always removed before eating, and this necessary process must have first stimulated effort to produce a fig without the objectionable parts. While this selection and improvement of edible figs was being carried on by the ancient cultivators the wild fig was not entirely left to itself. It was found necessary in some instances to propagate even the wild fig in order to procure the figs for caprification. What would be more natural than to suppose that those figs were especially propagated which produced greater abundance of pollen and a more perfect continuation of crops? This selection in a small way would in time give rise to several types, even among the wild figs, similar to those, perhaps, described by Pontedera, Gallesio, and others.

After the first objectionable features of male flowers were eliminated other improvements followed as to flavor, taste, sweetness, etc.

FIG INSECTS.

FIG WASPS OR BLASTOPHAGAS.

All known wild fig trees, and there are over 100 distinct species described[1] by botanists, are inhabited by very minute wasps known as "inquilines" or parasites, and scientifically described as *Blastophagæ*. (See fig. 16.) These Blastophagas not only visit the figs, but they live, breed, and develop in them; nay more, if deprived of their fig hosts, these Blastophagas could not live, breed, and develop anywhere else. The organization of these little wasps is such that while

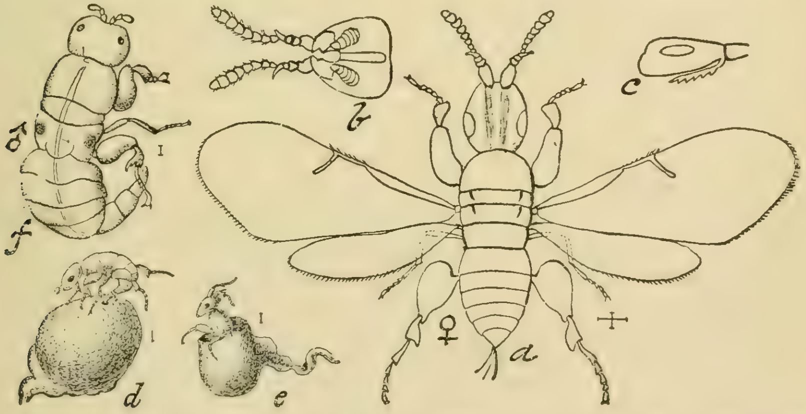

FIG. 16.—*Blastophaga grossorum*: *a*, adult female; *b*, head of same from below; *c*, head of same from side; *d*, male impregnating female; *e*, female issuing from gall; *f*, adult male—enlarged (after Westwood). (From Smyrna Fig Culture in the United States, by Dr. L. O. Howard.)

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[1] According to Willkomm, there are 500 species of figs described.

they may possibly feed themselves for a short time (though it is doubtful if they do feed at all), they could not possibly deposit their eggs elsewhere than in the "gall flower" of their respective fig, not even in the female flowers of the same fig. Even if they did succeed in doing so, their eggs would not develop elsewhere and the brood would soon perish. The species would thus become extinct. But this is not all. The relation between the fig and the Blastophagas is so intimate that in order to foster these little wasps nature provides the fig with flowers especially constructed to their use—the "gall flowers" elsewhere described. But if the Blastophaga is dependent upon the fig for its existence, the fig is hardly the less so upon the Blastophaga. Without the Blastophaga no fertile seed would be produced with any regularity (if at all) and the fig species would be in danger of perishing. The influence of the Blastophaga is somewhat different in different fig species. It has been shown that in one species at least not only the female flowers are dependent for their pollination upon the Blastophagas, but that the male flowers actually do not develop their fertilizing pollen without having first been stimulated by the mechanical action of the Blastophaga.

Figs are visited by many insects, but a distinction must be made between "visitors" or "messmates" and "regular boarders." The former visit the figs in order to feed, either on the fruit and its juices or upon other insects. The boarders or "inquilines" again breed in the fig and can not breed anywhere else. The former will injure the fig in various degrees, while the latter are absolutely necessary for the material maintenance and multiplication of the fig-tree species they inhabit.

LIFE HISTORY OF THE CAPRIFIG WASP (BLASTOPHAGA GROSSORUM).

If we during the month of June or July[1] cut open a "profico" or first-crop caprifig just when it is full grown we may notice that it contains a large number of gall flowers or galls, around which crawl numerous little insects, some of which resemble minute black wasps, while others of the same size are wingless and very differently shaped, as well as being of a yellow or brown color. A closer inspection will reveal to us that a number of the galls are perforated by a single round hole through which may either be seen the hollow of the gall, or the wasp itself, not having yet escaped. A closer inspection may even show us how the light-colored insects, which are the male wasps, are enlarging the holes in order to enable the females or winged wasps to escape. These respective insects are male and female of the same species known to naturalists variously as *Blastophaga psenes*, *Blastophaga grossorum*, or *Cynips psenes*. The number of female Blastophagas which may issue from a single profico is often very large. I have counted as many as two hundred from one fig, and it is known that some varieties of caprifig profichi may harbor as many as 700 wasps.

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[1] The time differs according to the climatic conditions of the locality. In Italy caprification is practiced in June. At Niles, Cal., the caprifigs mature in the middle of July. In Lower California, I found the Blastophagas emerging from the figs of *Ficus palmeri* in March, from what must have been the first crop of that fig. A later generation again emerged in September.

The male insects are the first to hatch and escape; with their powerful mandibles or jaws they easily cut through their galls and then set to work to liberate the females. Before the latter escape they are fecundated, while yet in the gall, by the males. Each gall contains only one wasp. The male wasps never leave the fig. They are so constructed that they could not very well live outside, and even inside the fig they soon perish, their life work having been accomplished in liberating and fecundating the females. The females do not tarry long in the fig, but soon find their way out through the eye of the fig, which has opened sufficiently to let them pass through without injury to their wings.[1] In case the fig has been injured and compressed in such a way as to close the eye the wasps will remain prisoners until otherwise let out—for instance, by cutting the fig.

With care and aided by a magnifying glass, we may further follow the female Blastophagas as they escape from their old habitation. Their first work is to look for figs suitable to lay their eggs in, the only object of the wasps now being to propagate their species, it being doubtful if they feed at all. As soon as outside of the old caprifig the female Blastophaga halts on the outside of the fig and endeavors to free herself of a whitish powder with which she appears to be literally covered. This powder is the pollen from the anthers of the male flowers of the caprifig in which she hatched and with which she came in contact when she escaped from the fig. This process of cleaning she performs in very much the same way as does a house fly, stroking herself with her front legs, bending at the same time the head, body, and wings. She never succeeds in getting entirely clean, as a large portion of the pollen will adhere in spite of all her efforts. But when she considers herself sufficiently clean she flies away and lights on a less than half-grown caprifig of the same or some other tree. The mammoni or second crop of the caprifig has by this time advanced so far in development that its interior flowers are just of the proper size and age to suit the wasps.[2] If there are no such figs at hand the wasps will soon perish. Having lit on a mammoni, the

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[1] In the Baja California species of Blastophaga which inhabits *Ficus palmeri* the wasps do not crawl through the eye of the fig, but cut a round hole below the eye and thus escape in the same way as they did from their galls, except that the hole made in the fig is larger than the hole in the gall.

[2] As has been shown elsewhere, this is not always the case. If there are no caprifigs of proper size the wasp can not lay her eggs.

Blastophaga finds the fig eye closed by scales.[1] But these scales are not impossible to penetrate. In order to enter the fig the Blastophaga saws out a tiny little piece of the outside edge of a top scale, which opens to her an entrance between two scales. Next she pushes herself under the scale and then zigzags herself through, until she reaches the interior hollow of the fig. But her efforts to get through between the scales have been tremendous, and in so doing she almost invariably loses her wings. They are always lost in the very beginning of her work and can be seen remaining, wedged in between the outside scales just like feathers stuck under the band of a hat. In order to ascertain the presence of the Blastophaga in a green fig it is not always necessary to cut the fig open, as the presence of the wings of the wasp sticking between the scales is a sure sign that the wasp has succeeded in getting in. And even if the wings have fallen off, the little wound caused by the gnawing of the wasp can be told by the minute drop of sap that has oozed out and hardened. It is this drop of sap which was, remarkably enough, for ages considered as being the real cause of the setting of the figs. If no wings and no gum are seen on the scale it may be safely assumed that no Blastophaga has entered the fig in question.

As soon as the now wingless Blastophaga has entered the fig she hurries down to the gall flowers, there to deposit her eggs. Of these she inserts only one in each flower. The egg is generally placed in the same way and in the same particular spot in the flower. This particular place lies between the nucellus of the fig ovary and the integument surrounding it. Observation shows that if left anywhere else the egg will not develop. In order to accomplish this the wasp first alights on the stigma of the gall flower. Then she extends her ovipositor and runs it down through the canal which, from the center of the stigma, leads through the whole length of the style to the funnel or entrance to the ovary of the flower. This is penetrated by the ovipositor, and the egg is laid and securely wedged in between the nucellus of the ovary and the integument surrounding it. (See fig. 17.)

As soon as the egg is deposited the ovipositor of the wasp is withdrawn. The lower part of the canal is filled by a filiform appendage of the egg, while the upper part fills with a brown exudation from the wounded cells. As soon as one egg has been laid the wasp departs to another flower, there to repeat the process. The egg-depositing power of a wasp is simply enormous, and one wasp is capable of laying an egg in each of the many gall flowers of a fig. After the eggs have all been deposited the Blastophaga endeavors to regain the outside of the fig in the same way she entered; but in this she rarely succeeds. Being by the egg-laying process completely exhausted, she

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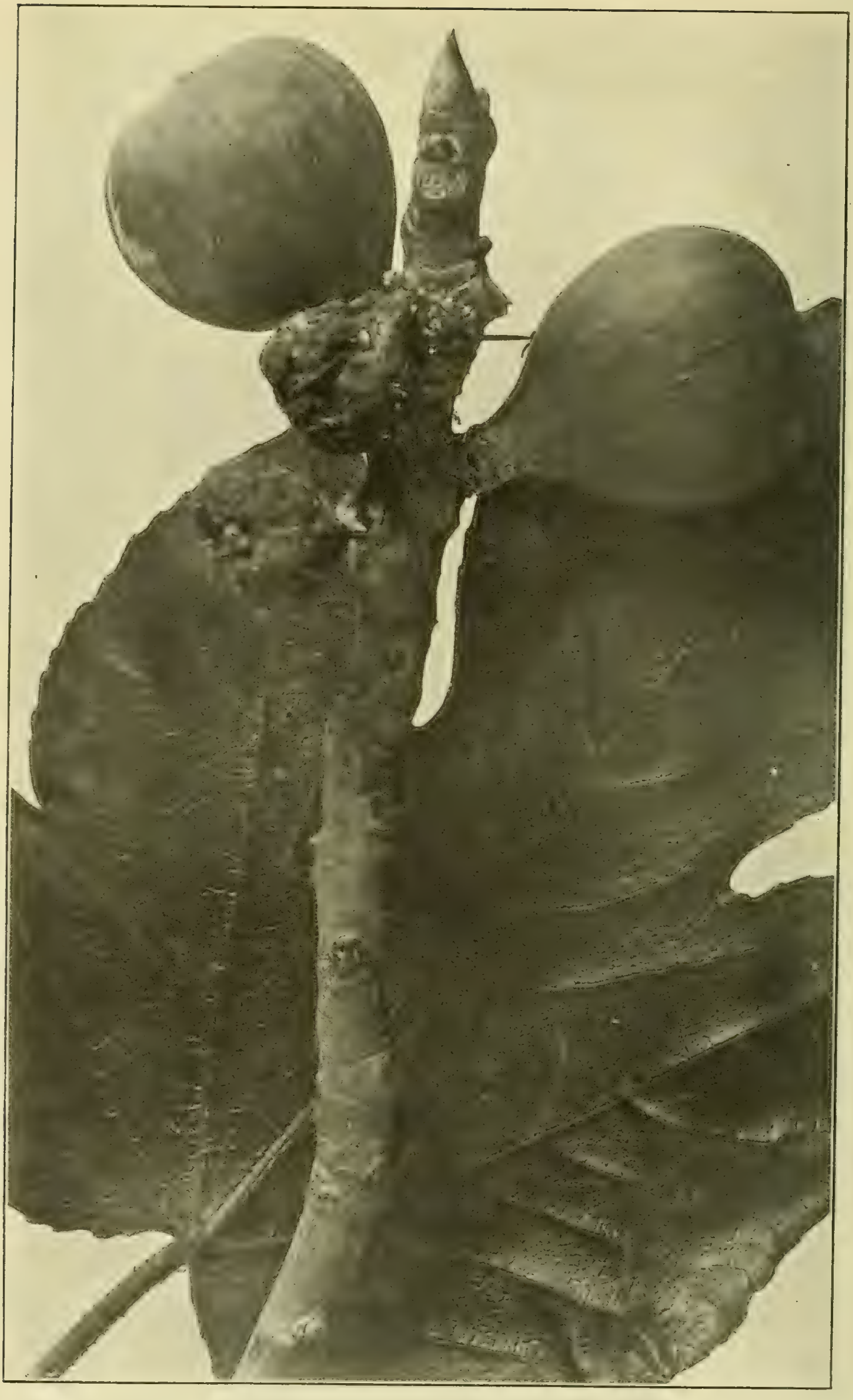
[1] The closing of the eye by scales is a necessity. If the eye was open the Blastophaga would find the fig full of other insects, and the function in the fig flowers would be seriously, if not fatally, interfered with.



CAPRIFICATED MAMMONI AND MAMME MILCO CAPRIFIG, JUNE, 1901 generally succumbs before she regains her liberty, and her dead body may be found in the opened fig. The work of the Blastophaga has not alone been that of depositing eggs. Involuntarily she has rubbed against some of the female flowers of the fig, and the pollen which adhered to her body when she entered has been deposited on the stigmas of these flowers. The effect of this pollination is the development of seeds in the female flowers. This would not have taken place without the aid of the wasp, because the pollen from another fig could not very well have penetrated through the closely thatched scales of the eye; and the pollen from a male flower in the same fig would only be ripe from a month to six weeks after the time when the stigmas of the female flowers will have attained their full development and receptivity. After the egg has been deposited the gall flower does not at once cease to develop. The embryo and kernel of the seed keep on growing for a month. After that the egg of the Blastophaga begins to develop, and when it passes into the larva stage it begins to feed on the embryo of the fig, which thus soon perishes. The integument of the ovary again grows and assumes the form of a large, hard, brownish, and glass-like gall. In two months the young female Blastophaga wasps have attained their full development, and after copulation with the wingless males are ready to leave the caprifigs; and this they do in the same way as they left the previous crop, the profichi. The males die within the figs in all the crops. They have performed their function and are of no more use. It may here be incidentally stated that even if the wasp's egg is not deposited in a gall flower, the latter will after a certain time cease to develop. It will never produce seed.

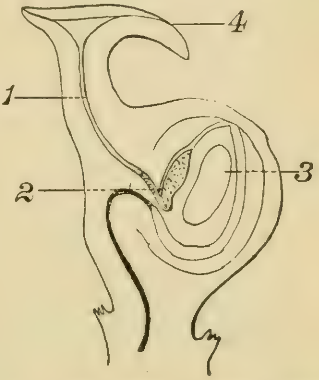


FIG. 17.—Gall flower of caprifig, after Solms-Laubach: 1, canal from stigma to ovary through which the ovipositor of the Blastophaga pushes the egg; 2, egg of Blastophaga; 3, nucellus of the fig ovary; 4, stigma modified for the use of the Blastophaga.

At this time the winter figs or the "mamme" destined to mature the following year are of the proper size and development required by the Blastophagas, which enter them in the same way as described above in order to deposit eggs. The mamme hibernate, and next spring, in March, develop and ripen and the young Blastophagas leave as before. (Pl. XIII.) They immediately afterwards enter the first-crop caprifigs and their deposited eggs will by the end of June or July have developed into perfect wasps.

The cycle of the Blastophaga is thus perfected and we have followed its life history through the various crops of the caprifig through the year. Each crop of figs has, as we have seen, had its own crop or brood of wasps, from which it follows that if the profichi or mamme should fail the wasps would also perish.

To facilitate the understanding of the life history of the wasp, as observed in Italy, the following diagrammatic table has been prepared.

A. *Profichi of the caprifig, October to June:*

1. In March or April these figs are less than quarter grown.
2. The Blastophaga females, issuing from the mamme, enter the figs and here deposit their eggs in the gall flowers.
3. In June, or two months later, these Blastophaga eggs have become fully developed, and the perfect wasps emerge to seek other figs.
4. In emerging the wasps are covered with pollen.

B. *Mammoni of the caprifig, June to autumn:*

1. In June and July the second crop is quarter grown.
2. The Blastophagas emerging from the previous crop penetrate into these second-crop figs and deposit their eggs in the gall flowers.
3. In doing so they also pollinate the female flowers.
4. In August or September the Blastophaga eggs are fully developed and the perfect wasps emerge, hunting for the young figs of the mamme.
5. A few seeds fully developed are found in this the second crop of the caprifig, none being found in the other two crops.

C. *Mamme of the caprifig, July, through winter, to March.*

1. In autumn the mamme are quarter grown.
2. The Blastophaga, hatching from the preceding crop, enter the mamme and there deposit their eggs in the gall flowers.
3. The mamme, with the gall flowers and the eggs of the Blastophaga, hibernate on the tree, slowly increasing in size.
4. With the advent of spring the mamme and the Blastophaga eggs develop more rapidly.
5. In March and April the Blastophaga eggs have developed into full-grown wasps, which emerge from the figs seeking the young figs of the first crop, the profichi, in order to deposit their eggs in them.

PRACTICAL CAPRIFICATION.

Process of caprification.—The process of caprification consists in bringing the caprifigs, of the proper age and crop, in close proximity to the edible figs, in order that the wasps, as soon as they leave the caprifigs, may be lured into the edible figs. Practically, this is accomplished in different ways, more or less proper and economical. In Smyrna, Syria, Greece, Italy, and Africa the caprifigs are pulled at the proper time in June, the profichi being the only crop used for this purpose. The caprifigs are then becoming soft and the male flowers ready to shed their pollen. The caprifigs are at once strung on split reeds or rough straws in quantities of four on each straw. (Fig. 18.) These straws are thrown over and suspended among the branches of the edible-fig tree. Another method, much inferior to the former, consists simply in cutting branches from the caprifig trees and suspending them in the edible-fig trees. This injures the caprifig trees and does not enable the cultivator to regulate the number of caprifigs according to the quantity actually needed. This method is in use only in certain parts of Portugal and Spain. A third way to accomplish caprification is to plant a few caprifig trees among the edible-fig trees, and to simply depend upon the wasps themselves finding their way in sufficient number to the edible figs. This method is the least proper of any for many reasons, one of which is that the caprifig thrives equally well or even better in poor, rocky, soil, and it would be more economical to give the good soil over to the edible-fig trees. This leads us to the necessity of having separate plantations for the caprifig.

Separate plantations of caprifigs.—In most countries where caprification is practiced it is a general saying that it is necessary to go to the hills for the caprifigs.[1] It is not only more economical, as has just been pointed out, to grow the caprifigs separately, but it is in many instances necessary. The soil and moisture in the orchard are not always suitable to the caprifig. It must be remembered that the caprifig is yet in its comparatively wild state, while the edible fig is a horticultural product or creation which can only be expected to attain its proper qualities under the most favorable conditions. Practically this is true. It frequently happens that when the edible figs are receptive, or their female flowers ready for pollination through caprification, the caprifigs growing in the vicinity of the edible figs are not properly developed, while other caprifigs grown in different soil and at a different elevation are just of the proper size and condition to furnish both Blastophagas and pollen. But an even more serious objection to having a few caprifigs growing in rich soil is that their crops are not always following each other in continuous succession. The Blastophaga, in order to properly propagate her brood, requires young caprifigs ready to receive her eggs as soon as she hatches out. Frequently the tree from which she hatches does not possess these figs, while other caprifig trees do. It is therefore necessary, in order to procure a constant supply of Blastophagas, to have a large number of different varieties of caprifig trees growing together. In a grove of such trees there will always be some that bear figs of proper size in which the wasps may breed. Such plantations of caprifigs should be made separately and in various localities, in order that the supply of figs may never fail. Quite frequently it also happens that the caprifig crop in a certain locality fails, while in a different one, where the climatic conditions have been dissimilar, the crop of caprifigs may be abundant. This shows the necessity of having caprifig plantations in various localities, especially in a country like California, where the caprifig trees are not wild and where frequent importations of caprifigs with inquilines are difficult if not impossible. When the caprifig crop fails in Smyrna fresh caprifigs are imported by the vessel load from the Grecian islands, and in all countries where caprification is considered necessary in order to procure a crop of figs a regular and profitable trade is carried on in caprifigs, which often bring much more than the edible figs.[1] Caprifigs should on no account be pruned, but allowed to grow wild. The wasps require shade, and the best caprifigs are always found in the densest shade. All suckers and small twigs on the main trunks of the caprifig tree should be allowed to remain.

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[1] Prof. Newton B. Pierce, of the Department of Agriculture, in Washington, who has observed caprification in Sicily, informs me that in the vicinity of Palermo the caprifigs are always brought from the "hills."

Quantities of caprifigs required.—The quantity of caprifigs needed to caprificate a fig tree varies with the size of the tree. The number depends also on the quality of the caprifig and the number of its wasps. In California from 20 to 50 profichi seem to suffice. If too few are hung on the tree an insufficient quantity of wasps is had and the edible figs are not all pollinated. If too many are hung too many wasps will enter the edible figs, injure their flowers, and, according to some observers, cause the figs to prematurely drop and decay.

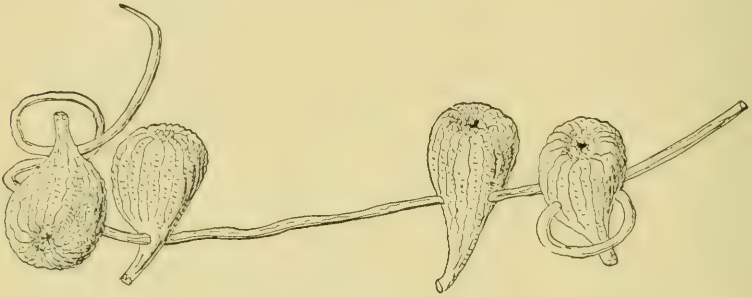

FIG. 18.—Caprifigs strung on reed used for caprification. The figs are dried and the wasps have escaped.

For smaller trees a less quantity of caprifigs is required than for larger trees, but even the largest in Smyrna are not given more than 30 strings to the tree. The caprifigs are hung on the limbs of the fig trees before sunrise and when the wind is not blowing. The process of hanging up the profichi must be repeated several times, as only those edible figs are pollinated which are of proper size and receptivity. For the younger figs new profichi must be supplied later on, if their maturity is required, and the quantity of caprifigs necessary at any time must be regulated according to the number of figs to be pollinated.

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[1] Solms-Laubach, p. 60, relates how a "Rottolo" of profichi in Ischia frequently brings half a lira. According to Leclerc, p. 16, c. p. 330, and Hanoteau et Letourneaux, pp. 433, etc., the caprifigs sell in Fort Napoleon for 2 sous per dozen.

Proper time for caprification.—Caprification should always take place when the female flowers of the fig are receptive. This can be easily ascertained by cutting open the fig. With a magnifying glass the stigmas of the female flowers should be seen to be bright and light greenish, with a peculiar fresh luster, as if they had been lightly varnished or moistened. Further, the stigmas and styles should be erect; if bent and brownish they are too old to receive the pollen and past their receptive state. This occurs in Smyrna and in the Mediterranean districts in the middle of June. The second crop, the only one used, is then in proper state of development to be caprificated. In California the time for caprification will vary with the locality. In the Bay district, around San Francisco, the Smyrna figs are receptive by the end of July; in the interior earlier, in June. The edible figs when ready for the caprifigs are about one-third grown, hard, and green. The caprifig, again, should be cut when the pollen is properly developed and just before it has burst from the anthers. The caprifigs are then becoming soft, though on opening them it will be found that the Blastophagas have not yet begun to hatch. The size of the fig varies with variety—as there are many varieties in caprifigs—but the average size would be an inch and a half long by three-quarters of an inch wide. Some caprifigs are much smaller. Thus the caprifigs received from Smyrna and taken there from the fig trees in which they had been suspended, were almost twice as large as those brought from Palermo.[1] The profichi and mamme are larger than the mammoni.

The various races of caprifig vary in size and softness, some remaining always hard, while others grow larger and become soft and pulpy.

As regards the Smyrna figs at the time of caprification, it may be stated that at the moment when their female flowers are receptive the scales at the eye loosen, or rather become flexible, allowing the wasps to enter. This softness of the scales may be easily ascertained, as by pushing a quill or a stick against the fig eye. It easily penetrates between the scales, without injury to them and without causing any juice to exude, if the fig is of proper size, while, on the contrary, if the fig is too young the scales will be found to be hard and fixed, can not be pushed back, and the least wounding will cause an abundance of milky juice to exude. If again the fig is too old, the scales will be equally hard and fixed and the fig will be yellow and will drop readily.

If the fig is cut open, the stigmas should be fresh and moist, the styles erect and greenish, not brown.

What takes place in caprification.—We have already followed the life history of the Blastophaga in the caprifig. Its history in the edible fig is somewhat different. The wasps can not live in the edible figs; they can only visit them. Shortly after the profichi have been suspended, or sometimes even before, the Blastophagas begin to hatch. It even appears that the pulling of the caprifigs hastens the maturity and escape of the wasp. As soon as these have hatched they crawl out of the caprifigs in search of young caprifig mammoni, in them to lay their eggs, as has already been described. But as the caprifigs are not near, no such mammoni are to be found. In place of them the wasps encounter only edible figs, and not being aware of the deception practiced, they enter these edible figs for the purpose of breeding. The flowers of the edible figs are, however, so constructed that the intentions of the wasps are completely frustrated. Instead of the necessary gall flowers, which are especially adapted to the ovipositor organs of the wasps, only female flowers with long styles are found and which are otherwise so modified that the wasps find it impossible to properly lay their eggs. All their frantic efforts to penetrate the canal of the style and to reach the fig ovary and its nucellus are in vain. The Blastophaga can not breed in any edible fig. Still, her visit has a very great effect on the edible female fig flowers, provided these are of the proper age and development. The pollen from the caprifig, with which the wasps were liberally dusted, adheres to the female stigmas, the effect being pollination and fecundation of the flowers. The Blastophaga herself dies and her dead body may be seen upon opening a fig which has not advanced too far in maturity.

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[1] By Prof. N. B. Pierce.

It is here assumed, as is really the case, that the wasp can not properly place its egg in the female flower, but even if she could do so or would accidentally do so, the egg would not properly develop, as it is only the gall flower which is suitable to the growth of the larva of the wasp. But even if by chance such development would take place the young wasp would quickly perish by being enveloped in the sugary liquid of the mature fig. A certainty is, however, that I have never found any gall in the mature Smyrna figs, which shows that no such development takes place.

What does not take place in caprification.—Since the most remote time so many opinions have been expressed as regards the consequences of caprification that it may be proper to here point out what does not take place. The old opinion that the gnawing of the wasp relieves the fig of its superfluous juices and thus causes it to mature is too absurd to be given much thought. The gnawing done by the wasps is so infinitely small that the fig, through the combined efforts of 20 wasps, would not lose one ordinary drop of sap. Figs wounded by a needle in such a way that many drops of juice escape do not show any tendency to set better, as I have repeatedly demonstrated. The gnawing of a few wasps can, therefore, not have any effect on the receptacle of the fig. The pollination alone can account for the maturing of such figs as require caprification. Thus, of all the figs which we have tried in California, some fifty or more varieties, only some seven or eight kinds do not set their fruit; all others do. To caprificate the regular and common kind of edible figs would, therefore, be a useless waste of time and work. They would probably produce some fertile seeds, but it is doubtful if their quantity would be sufficient to greatly improve the fig. It has been said that the Blastophaga produces a gall in the edible figs, and that this gall formation would cause the figs to set and mature, in the same way as a worm-eaten pear or apple ripens sooner than the uninjured fruit. But we have already seen that no such gall is produced in edible figs, and experiments in Italy have almost conclusively demonstrated that the entrance of the wasps does not hasten the maturity of the common fig.

We may, therefore, with a fair degree of certainty, establish the following facts:

1. The visit of the wasps to the female flowers of the Smyrna figs is powerless to produce fertility or maturity, except when accompanied by pollination.
2. The gnawing of the wasps on the scales of the eye, or the mere irritation of the flowers, does not produce a flow of sap sufficient to stimulate the fig to set and mature.

THE EFFECTS OF CAPRIFICATION.

Caprification can, therefore, only be effective and profitable in varieties which contain a majority of developed female flowers. If such figs are not caprificated, they will drop off shortly after the receptivity of the female flowers is past. On such figs the immediate effect of caprification is, first, the setting and the coming to full maturity of the fig receptacle (the fig); second, the development and maturity of the female flowers and their ovaries and seeds. Another important effect of caprification is the dropping at full maturity of caprificated figs, or rather of figs in which caprification has been successful. All Smyrna figs drop of themselves when ripe, while all other fig varieties in which caprification is not an absolute necessity, must be cut or pulled from the tree at harvest time, as they will fall only when past their prime. The advantage of having figs requiring caprification is, therefore, evident in all districts where such figs will grow.

The expense of caprification is much smaller and requires less labor than the pulling or cutting off of the figs when ripe; provided, of course, that the figs would set without being caprificated, which they will not do.

Besides the pomological or horticultural maturity of the receptacle the caprification produces the botanical maturity of the female flowers, which, as we will see, is of great importance as determining the quality of the fig.

THE IMPORTANCE OF SEEDS IN DRIED FIGS.

The greater value of caprificated varieties over those which do not require the process is to be sought in the development of fertile seed.

The seeds in our common figs consist only of empty, glossy shells, with no trace of kernel. All such seeds have no taste and can in no way contribute to the flavor of the dried fig. Not so, however, with Smyrna figs which have been caprificated. They all contain seed of large size, with a full, oily kernel, which, when crushed, is found to be in the highest degree aromatic and "nutty." Such seed, when present in sufficient quantity, greatly contribute to the quality of the figs, giving them an intensely aromatic flavor. It is only during the process of drying that the aromatic taste of the seed is permeated through the pulp of the fig, in very much the same manner as almonds and other nuts communicate their flavors to puddings, preserves, or canned fruits generally. Smyrna figs when dried are therefore more highly flavored than any other figs. To the fresh fig the seeds do not communicate this aroma, and fresh caprificated figs are therefore not superior to other fresh figs; at least the caprification does not produce the superiority, if there is one.[1]

WHICH FIGS SHOULD BE CAPRIFICATED?

The shortest answer to this question is, all figs which drop off if not caprificated. It has not yet been fully ascertained which these figs are. It is only certain that the great majority of figs will mature their receptacles without caprification. In California we have, however, for some ten years had growing several varieties imported from Smyrna, and of these none perfected fruit until they were artificially pollinated. This class, then, requires pollination and caprification, and must be caprificated if fruit is to be expected. We have also had other figs in California which have never matured fruit, though 20 years old.

Another class of figs requires caprification for the second crop. Among such varieties San Pedro is the most prominent one. But there are other varieties like the white San Pedro, the Portuguese of Italy, the Gentile, etc., all of which set their first crop, but drop their second crop. Microscopic examination shows that the second crop of these figs possesses fully developed female flowers, while the first crop which matures has only flowers with abortive ovaries. In another place in this paper I have related my experiments in caprificating the second crop of San Pedro and Gentile and the success achieved, undoubtedly proving that caprification is necessary for a certain crop while it is not necessary for another crop. Another class or type of figs which requires caprification for one of its crops is the one to which the Adriatic fig belongs. This class drops its first crop if it is not caprificated. The second crop is always set and matured without caprification.

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[1] I was the first one to call attention to the value of the fig seed as a source of aroma and flavor in dried figs. This is now almost everywhere accepted as true and as being one of the chief causes of the superiority of the Smyrna fig over non-caprificated figs. Leclerc was the first one to point out the superiority of caprificated figs, in Algiers, but he does not mention the cause (p. 332).

WHERE CAPRIFICATION IS PRACTICED.

Nowhere is caprification practiced more thoroughly, more constantly, and more successfully than in the home of the fig—Syria and Asia Minor. In the vicinity of Smyrna, the foremost fig region of the world, the figs of which are acknowledged superior to any grown elsewhere, caprification is a necessity. The fig crop without it would fail—at least the crops from all varieties which produce the Smyrna figs of commerce. The fact that some figs may be produced without caprification even there, must be attributed to the same cause which produces some fertile seed in the Italian figs without direct fertilization by caprification. The real cause of the setting of figs in either case is the presence of caprifigs in the vicinity, from which the wasps carry the pollen irregularly and sparingly, but sufficiently to produce a few figs and a few seed. The importance of caprifigs in Syria and Smyrna is so great that they often command a higher price than the edible figs, and in cases of failure of the caprifig crop sailing vessels are sent to distant ports, to the Grecian islands, to bring whole cargoes of the fruit. This bringing of cargoes of caprifigs, at great expense, by intelligent growers, must point to the value of caprification there, and is in glaring contrast with the occasional practice of some ignorant cultivators in Greece and Italy, who, failing to procure caprifigs, suspended galls of elm trees among their figs. As the culture of figs followed the immigration of the Phœnicians, and later on that of the Arabs, so do we to this day find caprification practiced in all countries formerly occupied by those nations—that is along the north coast of Africa, in Algiers and Morocco, in the islands of the Mediterranean, Cyprus, Crete, Sicily, and the Malta group, and farther west, in the southern parts of Spain and Portugal.

To this day caprifigs are highly valued and bring a high price in Tripoli, Tunis, Algiers, and Morocco, and parts of the Iberian Peninsula, especially when the crop is scarce. Leclerc tells us that in Algiers the profichi of the caprifig bring 2 sous per dozen (not quite a half cent). They are regular merchandise in all these markets.

In Greece caprification has been in vogue since very ancient times, as has been mentioned elsewhere. From that country it spread to southern Italy first after the time of Pliny, and has there been practiced ever since, principally in the territory of the old kingdom of Naples or in southern Italy generally.

To the general rule that caprification is practiced in Greece and Grecian colonies, one exception is mentioned by Solms-Laubach. In Marseille (Provence) and vicinity caprification is not practiced. It is also not practiced in central and northern Italy, or in the territories occupied anciently by the old Umbrians, Etrurians, and Latins, nor is it practiced anywhere in southern France and the Riviera. Solms-Laubach declares two causes for this to be possible. Either in ancient times caprification was practiced even there, and later on abandoned, or it was never introduced, fig culture having been only lately brought to these regions, and at a time when caprification was no longer necessary, varieties in the meantime having appeared which would ripen their receptacles without it. But as from the descriptions of Pliny and Cato it becomes evident that caprification was not known in Italy in their time, it is almost certain that in countries where caprification is not now practiced it has never been introduced. This is the case in all fig districts of America, as neither in the Southern States, in California, nor in Brazil, Argentina, Peru, or Chile, had caprification ever been even advocated until within the last ten years, or after the late introduction of the real Smyrna figs from Smyrna. This has also been the case in Australia and New Zealand. It is probable that to countries within easy reach of Syria the first varieties introduced were those requiring caprification; later only the self-ripening kinds followed, or were originated on the spot. The kinds which require caprification are much more exacting of climate, soils, and conditions generally than the self-ripening kinds, as we know that Smyrna figs, if transplanted to less favored localities, lose their superior qualities, even if caprified. As the self-ripening kinds became more common and more widely distributed the Smyrna varieties were allowed to gradually die out, but the caprification had taken such hold and had become so deeply rooted that it continued to be practiced on varieties which did not require it.

The circumstance, again, that caprification was not introduced into the more northern provinces, such as north Italy, south France, and north of Spain, must be sought in the unsuitability of those places for those varieties which required caprification. It is more than probable that in the above countries fig culture never assumed any degree of development until the advent of figs which did not require caprification in order to bear. The variety of caprifig which carries its mamme over winter is more susceptible to frost than other figs. At least it is impossible for the fig wasps to survive in countries where the caprifig crops are interrupted by heavy winter or spring frosts. This would also make caprification impossible, unless the caprifigs were yearly imported from more favored districts—a proceeding that would not prove practical or remunerative.

CAN OTHER INSECTS BE SUBSTITUTED FOR THE BLASTOPHAGA?

It is well known that figs are visited by numerous insects other than the regular Blastophaga, and the question arises to what degree could they be depended upon to carry the pollen from the caprifig to the edible fig, or could they do so at all. Some entomologists not acquainted with the practical side of the question have claimed that the Blastophaga was not required, but that any insect would do the work. In order to carry the pollen from one fig to another it is by no means necessary that the insect should breed in the fig. All it has to do is to crawl into the caprifig at the proper time and then crawl out and into the edible fig, and the pollination is accomplished; but in order that any practical result to the crop at large may come from this visit, several circumstances are imperatively necessary, and must coïncide. The insects must make these visits at the proper time; they must be of proper size to be able to enter the closed eye of the fig; they must be present in sufficiently large number to pollinate the fig crop, not single figs. As to the first point it will be seen that no other insect has been found which will have any business in the caprifig at the time when required; and even if the pollen of the caprifig would serve as its food, it would have no cause to afterwards visit the edible fig, which at the period when such visit is required does not produce any food, it being green and hard, with no trace of sugar. Insects only visit flowers in search of food or to lay their eggs. No other insect than the Blastophaga has been found to do the latter properly and at the time when required. The second point is readily understood. The eye of the edible fig is closed, and only an insect with a peculiarly developed instinct would know how to push its way between the closed scales. At this stage of the development of the fig no insects have been found which visit the figs, except the Blastophaga and some parasitical wasps which prey on her brood, and which would not enter the fig unless they knew the Blastophagas were already there. The most important point, however, is the quantity of insects required at a given time. Only an insect which will actually breed in the caprifig can be depended on, and it must breed in countless numbers. A few visitors would have no practical influence on the fig crops. They may fertilize or pollinate a few flowers, but they would be of no practical value to the grower and would not produce a crop. Taking it all in all no insect has been known, and no one is likely to ever be known, that can be substituted for the *Blastophaga grossorum*.

DIFFERENT SPECIES OF BLASTOPHAGA IN DIFFERENT SPECIES OF FIGS.

As far as is known, different species of figs are, as a rule, inhabited by distinct and characteristic species of inquilines. Thus *Blastophaga grossorum* has been found in only one or two nearly related fig species, and no other Blastophaga species has been found in our caprifigs. Parasitical wasps are always found together with the Blastophagas, preying on and developing in them just as the Blastophaga preys on and develops in the embryo of the fig. Even when different fig species grow close together do the wasps keep to their respective fig hosts; accidentally the wasps may visit other figs, but they do not breed in them. It appears almost certain that every fig species is inhabited by Blastophagas. Thus, in the botanical garden of Java, a row of fig trees, consisting of five different species of figs, was found to be inhabited by as many different species of Blastophaga, each variety in its own fig host, to which it was strictly confined. The cause of this localization of species must be sought in the organization of the wasps and their ovipository organs, which enable the insect to deposit its eggs in a certain kind of flower only, which again has been changed so as to accommodate the peculiarities of the wasp, her size and capabilities. Under such circumstances there is no hope that, for instance, the wasp inhabiting the Baja California and Sonora fig species can be made to inhabit and breed in our caprifigs. Even the sycamore fig is inhabited by its species of inquilines, but which have never been found in the caprifigs. It may, therefore, be assumed with great certainty that only closely allied fig species are inhabited by the same species of Blastophagas. But in many species of figs we find more than one species of Blastophaga. Some figs are inhabited not only by different species, but also by different genera of true Blastophaga, while the latter again are preyed on by parasitical wasps often equal to them in size.

SUMMARY.

Caprification, then, is an horticultural process, based on scientific principles. It has been practiced since very ancient times, and is yet in vogue in many countries. It is an absolute necessity in places where Smyrna figs are grown, or in places where it is of importance to pollinate such figs as possess receptive female flowers. Caprification causes such figs to set and mature when otherwise they would fall off immature. This horticultural maturity is caused by and preceded by the botanical maturity of the female flowers. Again, caprification is not required for that great class of figs which sets and ripens fruit without it, unless, indeed, it should be found practical, profitable, and possible to produce seed in such varieties of this class as possess receptive female flowers in sufficient number. Caprification is necessary also for such caprifigs as do not produce overlapping crops.

HISTORICAL NOTES ON CAPRIFICATION.

There are very good reasons for supposing that caprification is as old as the cultivation of the fig by man. That it originated in some of the oldest agricultural countries is much more probable than that the practice is of comparatively modern origin—for instance, invented by the Greeks during the time intervening between the Homeric songs and the era of Alexander. For this belief speaks the fact that the caprifig is probably not a native of Greece nor of any other Mediterranean country, but of southern Arabia, and possibly also of other countries in the vicinity of the Red Sea and the Persian Gulf. The fig was introduced into Greece, as has already been shown, and whether we presume that the first introduced fig race required caprification or not, it follows that this caprification was not and could not have been invented in Greece nor in any other country where the caprifig was not originally wild, and wild at the time the first figs requiring caprification were grown under cultivation. If the self-setting fig race had been the one first introduced into Greece, then the Greeks would never have thought of caprification, or if some uncommon genius had done so, he would have been obliged to go to distant countries in order to see, find, and bring home the caprifig, of which he could otherwise have had no possible knowledge. The discovery of caprification in Greece, as has been held by the majority of investigators except Solms-Laubach, would be as improbable and as impossible as the discovery of the placer mining of gold in a country where native gold occurs only in solid veins of ore.

Caprification must have originated in a country where the caprifig was wild. But particulars about the discovery are not forthcoming, the records having been forever lost. Even in the oldest books of the Semitic races no mention is made of any process which can with any certainty be explained as referring to caprification. As is stated elsewhere, in the Book of Amos we read of "bôtēs schiqmîm," which means "one who operates on the wild fig." But if this operation refers to caprification, or to the oiling of the fig, or to the yet common and necessary practice of cutting the "sycamore figs" with a knife in order to give an opportunity to their inquilines to escape, will always remain an uncertainty, with some probability that the last explanation is the correct one. A circumstance which makes it probable that caprification was, in very ancient times, practiced in Asia is the fact that Syria is yet the country which grows principally or almost exclusively figs requiring caprification in order to set and mature. In nearly all other countries other, though inferior, varieties have been or are being substituted—varieties which mature without pollination and caprification.

For the oldest written record of caprification we must go to the oldest Greek writers. Aristotle, the teacher of Alexander, and the best-informed scholar of ancient times, describes caprification in very much the same way as it is practiced to this day. Aristotle explains the effects of caprification through the bite of the wasp, which causes the air to enter the fig, etc. He, as well as all writers for a period of two thousand years, or until the time of Linnæus, were unable to give a true explanation of the effects of caprification.

The most minute description of caprification as practiced and understood by the ancients is given by Theophrast. Not only does he correctly describe the process of caprification, but he informs us of certain facts of great interest. One of these is that there are two races of figs, one which requires caprification in order to set fruit, and one which sets fruit without caprification. Theophrast was the first one to point this out, and he must have learned it through observation of the various fig varieties grown in his time. Another statement made by this writer is to the effect that caprificated figs had a lesser commercial value than figs not thus caprificated. Whatever may have been the case at this time, it is not so now. If Theophrast's statement is correct it can be explained by the fact of the Smyrna tribe not thriving in Greece or by their unimproved state at that time.

Theophrast also mentions how ignorant cultivators, instead of using caprifig, suspended other substances in the trees, such as galls from elm trees, the peasant believing that the wasps emerging from these elm galls would have the same effect as fig wasps. Of course, if the fig tree in which they were suspended belonged to a race which did require caprification, the effect of either variety of wasps (or of any other foreign substance) would be the same or none. Theophrast's explanation of the effects of caprification is similar to that given by Aristotle. He rejects the theory that the wasps close the eye of the fig and, through the prevention of the entrance of the air, cause maturity. On the contrary, he maintains that the wasps enlarge the eye of the fig, causing its juices to flow, suck up the superfluous "humors" of the fig, and that the warm and fermentation-producing air then effects the maturing of the figs. The differences between the two races of figs, of which one requires caprification and the other not, is explained by this author through the influence of soil and climate, as well as by a different nature of the fig, which enables it to ripen its fruit without the aid of the wasp. The circumstance that in Italy no caprification was practiced at his time he explains by the supposed drier soil and climate of that country, which absorbs the superfluous juices of the fig. The humid climate of Greece, he contends, makes it necessary to employ the aid of the wasps in order to relieve the figs of their superfluous moisture.

Pliny, the great Roman naturalist and compiler, follows Theophrast closely. He classes the caprifig as the wild fig, wanting in the juices necessary for the food of the wasps. The latter, not finding the necessary food, fly to the edible fig, and through nibbling enlarge the mouth of the fig and allow the fertilizing air to enter, which again transforms the milky juices of the fig to sweet honey. Pliny believed that caprification was practiced only in the Archipelago, from which it was later introduced into Italy. At the time of Pliny caprification was unknown in Italy. The account given by the great Latin naturalist is evidently only a compilation from other authors and from hearsay. He appears not to have made any personal investigations or examinations.

Through all the mediæval ages, or for over fifteen hundred years after Pliny, horticulture and natural science made little progress, and the opinions of the ancient writers were adopted as regards almost all points of human knowledge. So also their theories about caprification. For fifteen hundred years after Pliny this process was practiced by the cultivators of the soil in the same way as in the time of ancient Greece; no one was found to inquire into its nature and value, much less to solve the enigma of this the most interesting of all horticultural usages of all times.

In 1583 Cæsalpinus discovered the sexual organs of plants and was able to point out their functions, but his discovery bore no fruit as regards a better understanding of caprification, and all writers after him for nearly two hundred years followed the teachings of Theophrast, Pliny, and Plutarch.

In the early part of the eighteenth century two botanists occupied themselves with a closer study of the fig. One of them was Giulio Pontedera, who was the first to describe the flowers of the caprifig and their structure, though he did not recognize their sexual nature. He also studied the fig wasps and caprification, but little suspected the true nature and influence of the wasp. Pontedera ascribes the effects of caprification to the biting of the wasps, which caused the air and light to enter the fig. This is the more remarkable when we consider how very minute are the wounds caused by even many wasps. As seldom more than very few wasps enter one fig, it will be seen that the extra air that can penetrate on account of the wasp bites is very small indeed, if any at all.

Another investigator, one of the most prominent botanists of the early part of the eighteenth century, was Tournefort. He traveled in the Levant and in Greece and made special study of caprification as practiced there. Being well acquainted with fig culture in Provence, in France, he was well qualified for his time to take up the study of caprification. Tournefort had studied Theophrast and tried to explain his statement about the lesser value of the caprificated figs, through the necessity of drying such caprificated figs in ovens, which caused their aroma to disappear. As Solms-Laubach points out, Tournefort confounded the wasps with moths which infest dried figs, just as is so frequently done in our day. Tournefort describes the three crops of caprifig and mentions the two races of edible figs, of which one requires caprification, while the other will set fruit without it. The effects of caprification he explains in the same way as everyone before him, by the biting of the wasps, which causes the superfluous juices to escape. Finally, he mentions that a fig which in Provence without caprification produces 25 pounds of figs, in the island of Zea gives 200 pounds—a very unsatisfactory statement when we consider the distance of the two localities and the uncertainty that the two trees were actually of the same variety, not to speak of climate, soil, age, cultivation, etc.

It was reserved for Linnæus to discover the true nature of caprification. While previous to his time the nature of the sexes in flowers had been described and generally accepted, no one had thought of the possibility of an insect transmitting the pollen from one flower to another and thus causing fecundation. As Pliny of old had foreshadowed the theory of evolution, so did Linnæus a century before its rediscovery indicate how, at least in one instance, flowers were dependent on insects for their pollination. Linnæus points out how, in order that the female flowers of the fig may be properly fecundated, it becomes absolutely necessary for the pollen of the anthers to be distributed through the cavity of the fig. And this could not be accomplished if nature had not supplied the fig with a wasp which could carry the pollen from the male flowers to the female tree. And this wasp, he says, is the "psen" of the ancients, or the fig insect. The opinion of Linnæus was published in 1749. But Linnæus was not aware of the fact that some figs ripened their fruit without fecundation; want of material for investigation caused him to think that the fig was absolutely diœcious—in other words, that it possessed sexes distinctly separate, but on different trees.

John Hill, again, who published his great work, "A History of Plants," in London, 1751, refers only briefly to the fig and its caprification. He condemns Tournefort's theory of puncture and irritation, and states that pollination is the real effect of caprification; but he does not refer to Linnæus, though it is probable that he must have heard of the latter's views upon the subject.

Later in the century both Milne and Cavolini, independently of each other, discovered that a difference must be made between the maturing of the seed and the maturing of the receptacle, and that the former maturity, at least, must require pollination, even if the latter (or pomological maturity) could be accomplished without it. Milne clearly defines this by saying:

> The question supposes that the fig trees in this country bring fruit to maturity without assistance of caprification, and the fact can not be denied. The same thing, we have seen, obtains in Spain, Provence, and Malta: but the fruit, or more properly, the fruit vessel, is in all cases to be distinguished from the seed contained within it. If the male be wanting, the seed will not vegetate when sown; but the fruit may, nevertheless, swell and come to an appearance of perfection; and so it is observed to do in the instance in question, and in many others, especially when the fruit is formed of one of the parts less connected with seed, as the calyx, receptacle, etc.

Filippo Cavolini published his work on caprification in 1782, or twelve years later than Milne, whose opinion he had, however, not read. Cavolini believes the caprifig to be the male tree and the fig the female of the same species. He further notes the difference between the fig receptacle and the seed, and how the former can come to maturity on account of its stronger attachment to the stem of the tree, while the seed, which is only attached to the pericarp by its vessels, requires pollination in order to mature. This pollination causes the juices in the fig to flow more freely, bringing both the seed and receptacle to maturity. That some figs mature their receptacles and others do not depends on a defective structure, by which the juices from the stem of the tree are more or less obstructed in their flow into the fig's receptacle. As this obstruction is less or greater the fig requires more or less pollination to cause more or less sap to flow, while the seed, in order to attain maturity, always requires pollination. That the same variety of fig can mature in one locality without caprification, while in a different district it must be caprificated in order to mature its receptacle, depends upon differences in locality and soil. Cavolini's ideas are clearly expressed and to the point.

At the very end of the century a French botanist, Olivier, traveled in the Ottoman Empire, Egypt, Persia, and Greece, making a particular study of the fig. His descriptive work of his travels was published in Paris (year 9). Olivier came to the conclusion that caprification was a useless and ignorant proceeding, which should be abandoned. He says:

> This operation, of which some authors, both ancient and modern, have spoken with admiration, appeared to me to be nothing else than a tribute which man pays to ignorance and prejudice. Caprification is unknown in many parts of the Levant, in Italy, in France, and in Spain, and begins to be abandoned in the Archipelago, where it used to be practiced, and which, nevertheless, still produce excellent figs for eating. If the operation was necessary, whether fecundation be effected by the fertilizing pollen dispersed in the air introducing itself into the mouth of the fig, or whether nature makes use of a little fly to transmit it from one fig to another, as is commonly believed, it is evident that the first fig in flower could not fecundate at the same time those that have already attained a certain size and those which are only just appearing in order to ripen two months later.

The knowledge which Olivier possessed of caprification was in reality most superficial and defective, and some of his statements are even false and misleading and not worthy of quotation, except for the fact that disbelievers in caprification have pointed to him as an eminent botanist, who had conclusively proved the delusiveness of the process in question. Olivier did not even know that it was the caprifig which was used for caprification, but stated that it was the common "figues fleurs," the brebas, or first-crop edible figs, which were hung on the trees. This also appears again in the last lines of his statement quoted above, beginning: "First fig in flower," etc. His statement that caprification was unknown in Italy and Spain is also incorrect.

In 1820 Giorgio Gallesio, a prominent Italian horticulturist, published his treatise on the fig. How far Gallesio's statements were based on investigations in nature are not known. Later writers on figs have endeavored to show that his theories were founded principally on book learning, and not on observation. I am not of that opinion, as his statements show a frankness and fairness entirely indicative of truthfulness. Gallesio holds that there are two races of figs—one which requires caprification in order to mature its fruit, and one which matures without the aid of this operation. The different requirements between the two fig races depend upon a difference in construction of the figs, and each race retains its characteristics, regardless of the influences of soil and climate. The difference in construction lies in the ovary of the fig. Some figs have ovaries without ovules, and those figs which can not be fertilized can also not feel the action of the pollen from the caprifig. These are the mule figs. The other class of figs, with perfect ovules, are sensitive to the pollen, and under its influence develop perfect seeds. These he calls semi-mules. The fecundation causes the juices to flow to the fig and effect its maturity. The caprifig alone containing the pollen is, therefore, necessary, and the only way to apply it is through caprification.

Gallesio also describes a caprifig with only female flowers—"the fico semi-mula." His statement that the original wild caprifig bore only one crop of figs is shown by Solms-Laubach to be erroneous, or at least very improbable.

In the middle of our century the Italian botanist Guglielmo Gasparrini published a series of four different treatises upon figs and caprification, extending in time from 1845 to 1862. No one has contributed so much to our knowledge of caprification as Gasparrini, and no one has made as many original researches as he has. Gasparrini, as Olivier before him, takes a decided stand against caprification, believing himself warranted in so doing by the result of the experiments made by himself. Gasparrini's experiments have been by many considered conclusive and almost final, and his views have been adopted almost unchanged by later writers on the subject of caprification. While conceding that Gasparrini's experiments were scientific and fairly carefully made, and highly interesting and demonstrative, I hold that the main conclusion which he drew was singularly illogical, though it may have been warranted by the insufficiency of his experiments. Gasparrini's almost only, but fatal, error was that he experimented only on a few Italian figs, not even suspecting that there might be other figs differently constructed. From his observation he concluded that because "a few were so," therefore, "all must be so." Gasparrini's experiments are too elaborate to be here noticed in detail. Those who wish to further study the subject are referred to his respective works. A summary of his theories, experiments, and conclusions is found in Biological Studies on Figs, Caprifigs, and Caprification. A very short résumé must suffice here.

Gasparrini concluded that the caprifig belongs to a different species from the cultivated fig; that the Blastophaga is not necessary for pollination; that caprification is useless and injurious and should be abolished.

It is not intended to condemn Gasparrini's work, which, though believed by many to have been somewhat defective, has still proven of much interest and value. His experiments have shown us that caprification does not hasten the maturity of the common fig, and that it is not the sting itself of the wasp which influences the setting of the fruit of the edible fig. They also show that many figs which are regularly caprificated by the fig growers require no caprification, and that, as far as these figs are concerned, caprification could be abandoned. This point is confirmed by the circumstance that these same figs mature in countries where no caprifigs are grown.

It is not easy to see how any other conclusions of importance can be drawn from the experiments of Gasparrini. It must always be regretted that he never thought of the possibility of there being any other race of figs than that one which he happened to have under his eye. How different, for instance, would his conclusions have been if he had had the true Smyrna figs to experiment on!

In our own times no one has given as much study to the fig question as Prof. H. Count Solms-Laubach. His researches were published in 1882, and contain a perfect mine of knowledge, partly compiled, partly his own investigations. While scientifically investigating his subject and studying the figs and the fig insects in Italy, Java, and France, it appears that he had no opportunity to make direct experiments in caprification, but founded his opinions principally on the experiments of Gasparrini. He sifts the knowledge of others with rare ability and patience, and adds numerous and interesting observations of his own. His researches are of the utmost importance. As a botanist he rejects, as insufficiently proven, Gasparrini's theory of parthenogenesis, and, showing that Brazilian figs produce no fertile seed, concludes that caprification is necessary for that purpose.

During his investigations in Java he discovered that most figs growing there consisted of female trees as well as of male trees, and he found that the male tree possessed a flower especially adapted to foster the Blastophaga, a kind of degenerated or differentiated female flower, which he calls the "gall flower." This gall flower has probably lost its power to produce seed. Returning home and investigating the caprifig, he found that even this fig contained this gall flower, almost exclusive of any real female flower. He further shows how different species of figs are inhabited by different species of Blastophaga. He also unconditionally adheres to the theory of the caprifig and the fig being of the same species. Later on he adopts the theory of Fr. Müller, that the edible fig is the female plant and the caprifig the male plant. But he was entirely unaware of the existence of a race of figs constructed differently from the common edible figs which he had investigated, and he shared the opinion of Gasparrini that all figs were affected by caprification in the same manner, though he recognized the absolute necessity of pollination and caprification in order that fertile seeds may be produced. But if caprification is not needed any more, it was once a necessity, ages ago, when the fig was first brought into cultivation by man, and before the present race of figs, which requires no caprification in order to set and mature, had originated. The class of figs which the Italians considered as requiring caprification had been shown to set fruit without this operation; the class that once required caprification must, therefore, have been lost, and been superseded by a better, more modern class, evolved from the former. He comes to the following conclusion:

> Caprification was once, ages ago, a necessity; it is now no more useful, but only a horticultural operation. transmitted from generation to generation, down to our time, and in its original form. Its scientific importance as means for judging the modifications undergone by our economic plants (culturpflanzen) in the course of ages can hardly be overestimated.

It is hardly necessary for me to remark that Solms-Laubach's conclusions were based on his belief that this race, once requiring caprification, has been lost, has "died out," as no longer of value. Now, if this race has not died out, but can be proven to be yet extant and to constitute our best figs, the conclusion arrived at by Solms-Laubach must fall. Professor Solms-Laubach has since acknowledged the correctness of this.

A late contribution from the author's knowledge of caprification is found in his Biological Studies of Figs, Caprifigs, and Caprification, already referred to several times. These experiments were conducted in various places in California, and have, in the author's judgment, conclusively proven that caprification is a process of pollination by the aid of wasps; that it is a necessity in order to cause the Smyrna figs to bear; that the first crop of San Pedro figs does not require caprification, while the second crop of this tribe of figs will not set and mature fruit without it. The writer has also shown that there is a fourth kind of flower in the fig—the mule flower. He has also pointed out for the first time that we possess five distinct tribes of edible figs, the nature of which he has described, and has endeavored to trace the phylogenetic origin, showing that while the Smyrna figs have descended from the female caprifig tree the other tribes may have descended from the male caprifig tree. From the nature of the seedlings grown from imported and caprificated Smyrna seeds he has also demonstrated that caprification is a process of pollination and not one of irritation, as has been supposed by the majority of investigators since the time of Aristotle. The latest as well as the best work on caprification, however, is from the pen of Dr. L. O. Howard, of the United States Department of Agriculture. Dr. Howard is the only entomologist who has attacked this difficult subject with a thorough knowledge of insect life and its relationship to plants. As a consequence little in the life history of the Blastophaga now remains to be elucidated, and the reader who wishes a more detailed account of this subject is referred to Dr. Howard's work published in the Yearbook of the Department of Agriculture for 1900. It was published too late to be quoted in this paper.

CHAPTER V.

CLIMATIC CONDITIONS.

GENERAL REMARKS.

The climatic conditions under which the cultivated fig will thrive and bear fruit are less restricted than those which favor or disfavor many other fruits. What other fruit can be grown out-of-doors with moderate success through a district ranging from the south of Scotland to the Cape of Good Hope, from the shores of the Atlantic through Europe and Asia to China, from Chile to California and Oregon, and on the eastern coast as far north as Washington? Nevertheless, there are, necessarily, certain conditions which are particularly favorable to the cultivation of the fig. Unfortunately, the information at hand is very unsatisfactory, as the countries where fig culture has been most successful are those where the horticulturist has not found it necessary to invoke the aid of the scientist in securing good results. Aside from our own personal experiences, almost the only sources of information are consular reports and works of travel by northern tourists and explorers; but they seldom contain the information desired.

The warm, temperate climate of the Mediterranean region is the most favorable to the varieties of the fig that are useful for both drying and eating fresh. Even in this region some parts are much more favorable than others, and we look upon Smyrna, Sicily, Provence, Andalusia, and Algarve as ideal places and climates for the highest development of the fig. But even in these localities the areas are restricted, and in the study of climates and the search for ideal climatic conditions comparison must be made with such places as Aidin, Palermo, Draguignan, Solon, etc., in which the climatic conditions must be the standard with which to compare our own. It will be seen that the area of the most perfect fig culture nearly coincides with that of the olive. Taken as a whole, the olive and the fig thrive under the same conditions, but the accommodative powers of the fig are much greater than those of the olive; it quickly repairs injuries from frost and hurricanes and accommodates itself to almost any environment. But while the famous figs are grown in less than half a dozen localities, a first-class olive cult is spread over an immense territory and, remarkably enough, in localities where the finest figs are not found. The two cults, therefore, while agreeing in general, do not coincide in details, for the fig, while less exacting as regards climatic conditions than the olive, demands peculiarities in climate in order to attain perfection, which few localities can supply.

TEMPERATURE.

The proper temperature for the fig varies with different varieties. While some figs will mature with comparatively little heat, others require a great deal, and can hardly be given enough. Most excellent figs for the table may be grown where the heat is moderate, while varieties for drying require much more heat. If we take the figs of Smyrna, Kabylia, and Algarve as standard dried figs, as we must certainly do, then it is safe to say that the temperature in the shade during the drying, or rather during the maturing, of the figs should never, or seldom at least, exceed 100° F., or about 130° in the sun. Figs will, however, stand as much heat as the sun can give them, provided they are not exposed to the direct rays. However, since the best figs for drying are produced near Smyrna, where the heat seldom reaches over 100° F., we must conclude that a higher temperature in the shade is not desirable. Too strong direct heat and light may burn or scald the figs, thus bleaching and hardening the skin on the exposed side. Excessive heat during the season when the figs ripen is consequently undesirable.

In studying the effect of excess of temperature each variety of the fig must be considered. Some kinds are very hardy, comparing in this respect with peaches, and even apricots. The tender southern varieties of figs should never be exposed to a colder temperature than 16° F., even if well matured; and if the branches are immature, 18° F. will kill the trees to the ground. A young fig tree can endure much less than an old one; consequently, it often happens that trees during the first two or three years after planting are cut to the ground and killed by frosts of from 18° to 22° F., and very often the variety is at once condemned as unsuited to the region. As the trees grow older they become hardier, show less growth, and are less injured by frost. The first few years are therefore the most important ones, during which time the trees should be watched and protected in the winter. If brought safely over that period most varieties will be found hardy in the valleys of California. The writer has seen young Adriatic figs cut down to the soil three years in succession during temperatures of 18° F., and the same trees, after having successfully reached four years or over, were not injured by much heavier freezing. In the grounds of the Department of Agriculture, Washington, D. C., may be seen a real Smyrna fig tree which must have grown there a great many years, as it is 12 to 14 feet high and has never been protected. Similarly in the streets and yards of Washington there are quite a number of seedlings 2 or 3 feet and upward in height, which have sprung up from Smyrna fig seed. In order to facilitate the proper ripening of the figs it is necessary that the nights should be warm or moderately warm. Cold and chilly nights, even if the days are warm, will cause the figs to dry or remain hard, with little sugar.

RAINFALL AND MOISTURE.

Few fruit trees enjoy moisture as much as does the fig. In very moist or even wet soil the fig tree grows most luxuriantly and attains a high degree of development; but in such localities the quality of the fruit is inferior, being less sweet, insipid, or even sickening to the taste. Different varieties require different degrees of moisture in the soil, and in order to produce the best quality of fruit the soil should never be more than moist, not wet, at least not during the fruiting season. In Smyrna the yearly rainfall averages 25 inches, and this must be considered the standard rainfall required by or desirable for the fig designed for drying, provided the soil is of such a quality as will retain the moisture. With the proper cultivation of a good soil with the above average rainfall, even at the end of the dry season, moisture will be found a few inches below the surface sufficient to cause the soil to cohere when pressed. If drier than this the trees will suffer, both as regards wood and fruit, while if more moist the figs will be inferior. The rainfall should be all in the rainy or winter season and none after the figs have begun to mature. A shower of rain on mature or nearly mature figs is very injurious, causing the figs to break open, turn sour, and rot, and the crop may be a total loss. Moisture in the air, such as is caused by and following rain and fog, is also injurious to the fruit, although it favors the development of the tree. The fig requires a dry, but not too dry, air, in order to produce superior fruit. Still, good and very superior fruit is grown close to the ocean, but out of reach of fogs. Some of the Smyrna figs are grown within the sight of the Mediterranean near Ephesus, and the figs of Algarve and Malaga are similarly not far from the sea. In California excellent figs are grown around San Francisco Bay, though not near to the shore. But fogs are always injurious to figs, preventing the development of sugar and injuring the color of the skin. Even dew is not desirable, especially when the figs are ripening, and no figs should be picked before the dew is thoroughly evaporated.

WINDS.

Winds are supposed to favor the maturing of the figs, provided they are dry and not too warm. In Smyrna the finest figs are those gathered when the dry north wind is blowing. The fig can hardly be injured by ordinary heavy winds, as there are few trees which grow as evenly balanced as the fig. This fact makes the fig especially suitable for wind-breaks during the summer months, while its deciduous character unsuits it for this purpose in the winter.

IDEAL CLIMATIC CONDITIONS FOR FIGS.

Summarizing the general climatic conditions favorable for the most perfect development of the fig, we have the following:

(1) Two seasons, one rainy and one dry, the latter during the warm

season of the year. The more distinct these seasons the better, showers during the ripening season being very injurious.

(2) Warm, dry winds during the ripening of the figs, accompanied by sunshine and absence of clouds and fog; the temperature in the shade not regularly to exceed 100° F.

(3) During the winter the thermometer should not fall below 18° F.

(4) Natural rainfall of not less than 25 inches, confined to the winter and spring months of the year, say from November to May.

(5) Warm nights during the summer also favor the fig, its development, and its quality.

SOILS.

GENERAL REMARKS.

The fig will grow in almost any soil, and with an abundant water supply will do fairly well even in somewhat poor soils. Lime soils are more favorable to the fruit than others. Whatever the soil is, it must, in order to secure the best results, be warm, have the property of retaining moisture when properly cultivated, and it should be deep, well drained, and not underlaid by hardpan or bed rock. Figs will grow in almost all places, but with rocky ledges or hardpan close to the surface the trees will suffer in times of drought, and in badly drained soils the fruit will be of inferior quality. The most favorable soil is one which is deep, loamy, soft, full of humus, and with an abundance of lime. The latter is indispensable in producing a superior drying fig. In very dry soils the fig is small and woody, most varieties requiring continually moist soils. Bottom lands and mesas or table lands adjoining rivers are the most suitable places for fig orchards. The alluvial soils in such localities generally have the faculty of retaining moisture so necessary to produce pulpy figs. It is an additional advantage if these soils are sandy, provided they also are rich in soluble plant food. Not all sandy soils are suitable for figs; only those are which are really rich in plant food and in lime. Very heavy clay or adobe soils should be avoided, especially in localities which are naturally cold and damp. Alkali soils are not suited to figs, as the alkali tends to counteract the necessary formation of sugar in the fruit. It is well known that both carbonate of sodium and sulphate of sodium change the crystalline properties of such fruit sugars as those contained in beets and cane, and if present in too large quantities will prevent the formation of sufficient sugar to pay the grower for his work. Figs, as well as raisin grapes and beets, will grow in alkali lands and produce, but the fruit should be used for table only and not for drying or for a product where sugar is the most important part.

SOILS IN THE EUROPEAN FIG DISTRICTS.

No chemical analysis of the best fig soils has ever been made. The soil in the Meander Valley, near Smyrna, the principal fig district in the world, is a rich and loose alluvial loam of great depth, containing a large percentage of lime and potash. In Sicily, in the Palermo district, where the largest and sweetest figs of Italy are grown, the soil is mostly of an alluvial nature, also containing much lime. The soils of Algarve, in Portugal, are principally mesa soils of a semialluvial nature. It will be remembered that until within a comparatively few years the Algarve figs were considered the best in the market, but later on Smyrna, through care in selection and curing, took the lead. Some of the best Italian figs—those from the province of Catania, in Sicily, and those from Pozzuoli, not far from Naples—are grown on volcanic soils, and to the lightness and other good qualities of this soil is attributed the good quality of the figs. The figs from Pozzuoli are said to bring a better price in the Naples market than any of those from southern Italy.

RECAPITULATION.

(1) Edible figs, to be eaten fresh, are less exacting as to soil; they require somewhat more moisture in the soil.

(2) Figs for drying require warm, moderately dry, and quite sandy, but especially limy, soils.

(3) Heavy wet soils produce coarse figs, and so do heavy clayey soils generally.

(4) Sandy soils produce sweet figs of light color when dried.

POSSIBILITIES OF FIG CULTURE IN COLD CLIMATES.

Although fig culture will always be carried on most successfully and profitably in semitropical climates as at present, the fig tree readily accommodates itself to less favorable regions and may be grown in many other localities. It appears that the real barriers to fig culture are short and cold summers. With warm days and long summers, such as are found in North America and central parts of Asia, a successful culture of figs might be accomplished even with rigorous winters. In another part of this volume the writer describes how, by covering the fig trees either with mats or with earth, successful crops are raised far outside of the favored regions of the fig, and the figs thus produced are not poor in quality, but are really good, sweet, juicy, and wholesome. Such fig culture is now practiced in the vicinity of Paris, in various places in England, and even in the highlands of central Asia, where the winters are extremely rigorous. In the khanates of Bokhara and Samarkand figs, pomegranates, and grapevines are grown with winter protection; also in the vicinity of Pekin straw protection is required. Some varieties of figs require much less heat and can stand much more cold than others, one of the hardiest varieties being the semidwarf growing Brown Turkey, with its short and crooked branches and its deeply cut leaves. There is no doubt that figs producing the first crop for the table could be grown profitably over a vast area of central North America and Europe in places where this delicious fruit is now entirely unknown in its fresh state.

CHAPTER VI.

PROPAGATION OF THE FIG.

GENERAL REMARKS.

The fig tree may be propagated in various ways. Few trees are as easily grown and few require less skill and previous experience. The fig tree may be started in the orchard in the very place where it is destined to remain, or it may be propagated in the nursery and later on transplanted. The former method can be used only when the desired number of cuttings is available. Under favorable conditions it is the best way to start a fig orchard, as this method is less expensive and requires less time. But conditions may make other modes of propagation necessary, especially when large cuttings of the varieties required are not to be had or are too expensive to justify their use.

While with proper care a fig orchard is very easily started, some little neglect and ignorance of detail frequently cause great loss of trees during the first season. It may be truly said that the fig is both the easiest and the most difficult tree to grow.

CUTTINGS OR ROOTED TREES.

The relative value of cuttings or rooted trees is entirely determined by circumstances, such as the mode of planting, care given, experience of the planter, facility with which one or the other may be procured, etc. If cuttings of the desired size, age, form, and structure can be had, they are sure to prove very much the cheapest. If the soil can be kept in proper condition and if the cuttings are fresh and healthy, cuttings will be found preferable to trees in starting a new plantation. Cuttings, if fresh and of proper quality otherwise, have this superiority over fig trees, that they can always be depended upon to grow if given reasonable care. The cutting of the fig tree is remarkably hardy, does not dry out readily, and if once injured can be readily restored to life without much risk of a greater loss than a few per cent at most, provided, of course, the drying out has not gone beyond a certain limit. Rooted fig trees are in our country easy to get, as they are grown here for sale. They have also the advantage of being all of a certain size, can make standard trees at once, and, provided they are fresh, they will bear sooner than cuttings. But rooted fig trees have some drawbacks not possessed by other fruit trees, except, perhaps, the olive. The fact is noted that if the trees are allowed to get dry before being reset they are very liable to die back to the ground and thus become even of less value than cuttings. Many failures in fig plantations arise from this cause. The fault lies partly with the sender or the nurseryman; partly, or more frequently, with the receiver, whose knowledge of caring for the trees has been at fault. If the trees are cared for properly little or no loss is probable. A plantation started from trees will be more uniform, will bear quicker, but will cost more than one started from cuttings. It should be remembered that cuttings of the proper size for planting in the open ground must be much larger than cuttings to be first planted in nursery rows. For the former purpose long cuttings are required; for the latter even the smallest will prove valuable. Unlike other nursery-grown trees, fig trees are always started from cuttings. A cutting started direct in the orchard is therefore likely to make as good or even a better tree than one that has been transplanted. If long and proper cuttings can be had they are preferable to trees, but well-grown trees are preferable to small cuttings.

FRESH AND DRY CUTTINGS.

The main point in planting a fig orchard from cuttings is that the cuttings should be perfectly fresh. To be sure of this, each cutting should be clipped at both its upper and lower ends just before planting, except in case the top of a cutting ends in a terminal bud. Of course, the clipping is only to learn the proper state of the cutting. The cutting is fresh if an abundance of milky juice exudes from the inner bark or cambium layer immediately when the cut is made. The freer the juice flows the better the cutting, while if only a few tiny drops exude here and there the cutting is unfit for planting and must be revived. If fresh, the cutting should be plump, and the year's wood should be glossy, bulging, and no sign of shrinkage should be be seen. The buds of a cutting which is in proper condition should also be plump and the outside scale of the bud should not be dried. When this scale is torn off the milky sap should exude from the wound.

Such plump fig cuttings will readily grow, and if each cutting is examined before planting, and if the planting is done in proper soil and good care is given, there should be less than 1 per cent loss from failure to grow.

A dry cutting may be easily detected. Its wood is shriveled, and when cut transversely little or no milky sap exudes, or the sap will be thin and watery. When the inner green bark and cambium are lifted with a sharp knife they appear dry and shrunken or even discolored. The buds on a bad cutting are more or less dry; the outside scales are shrunken and do not closely cover the interior ones, and they appear hard when pressed with the fingers. These characteristics of the buds are sure signs as to the quality of the cutting, as they can be detected at a glance, even at a distance. A dry cutting has a different color from a fresh one, the former being grayish and dull, the latter being blackish or dark and brilliant, reflecting the sun or light.

BEST TIME FOR MAKING CUTTINGS.

The fig tree is never entirely dormant, as there is always some sap moving. Even in winter, when all the leaves have fallen, a cut in the wood will cause the sap to exude. But the fig has periods of greater or lesser activity, the latter beginning in the fall of the year after the leaves have fallen. This period should be chosen for propagating the fig. The flow of sap at that time does not interfere with the rooting of the cuttings, as it is the downward flow of the sap which produces the callus from which the roots develop. Later, when the leaves have started, the fig roots with more difficulty. The proper time for cuttings is therefore in November and December, and if the ground is warm and sandy, the sooner they are planted the better. If the ground is very cool and clayey, the making of cuttings, or at least their planting, should be postponed until February or March, although the earliest planted cuttings always prove the best, provided the conditions have been proper. Cuttings which are to be sent away should always be cut early, as they stand long shipments better than cuttings which have been made late. The latter contain much more sap, and on this account are less dormant. For planting out of doors, the earlier the cuttings are made after the frost has caused the leaves to fall the better.

HOW TO MAKE CUTTINGS.

If a large fig plantation is to be started it is most practical to make the different sizes of cuttings at the same time and to assort them afterwards. If cuttings are required year after year, it is best to have certain trees set apart for that purpose, as when fruiting trees are cut back they will cease to bear properly for one or more years, or they will bear inferior fruit. The branches from which the cuttings are to be made should be cut back at once to the main stem of the tree. After being thrown to the ground the large limbs should be sawed or cut off immediately and assorted as to size. After being conveyed to a cool place they should be protected from the sun and wind. This may be done either by heeling the cuttings in the ground if they are apt to remain there for some length of time—a week or ten days—before being cut up. But if they are to be worked up at once they may be merely covered with straw, wet sacks, or blankets. If covered at all they must be covered well; and not more than one-tenth part of their whole length should in any case be exposed to the sun or winds. This refers also to the heeling in, when nine-tenths of the cuttings should be below the soil.

The large cuttings should be made up first. The large limbs should be sawed off square across and cut, as straight as possible, in lengths of from 3 to 4 feet. These large cuttings may be at once transferred to the orchard and planted directly where they are to remain. If this can not be done, these large cuttings may also be heeled in. This should be done immediately, and if possible the same day as cut.

The small cuttings may be cut up at leisure in the shade. If they have been previously heeled in they should first be washed, as the soil will spoil the shears and retard the work generally. It is the most profitable to make three different grades of cuttings, all grades being cut at the same time. Have the men sitting on low boxes or tripod chairs, each man with a pile of rough branches or large cuttings before him, and three boxes of different sizes at his side, these latter for the reception of the newly made cuttings. As a rule the different sizes may be 12 to 14 inches for the largest and thickest, 6 inches for the medium size, while the tips or shortest branches may be made 1 or 2 inches in length and serve as the smallest grade. The two largest sizes should be placed in layers with the butt ends in the same direction. This is important, as otherwise many of the cuttings will be planted upside down. The small tips may be thrown promiscuously into the box.

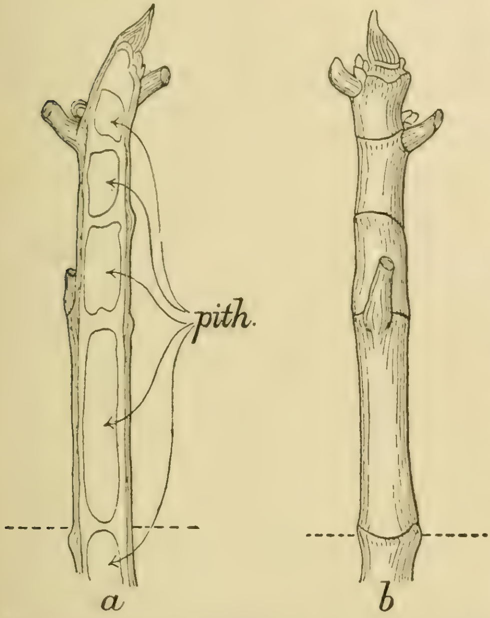


FIG. 19.—Fig cuttings: *a* showing the pith and nodes at the joints.

In making the cuttings it is necessary that the shears should be kept sharp, and a hone should always be handy for that purpose. Care should be taken to cut exactly at the joint, where there is no pith visible. By splitting a fig-cutting lengthwise it will be seen that the pith does not extend through the joint, but that there is a place in the joint where the wood is solid. (See fig. 19.) If the cut is made exactly in this solid part, both the bottom end of one cutting and the top end of the one below will be closed by solid, woody matter, and not exhibit any pith. The advantage gained is that the solid bottom end will root easier, while the top end will be protected from insect borers, which often work down through the pith from the point where it is exposed. The part of the cutting thus injured will dry and die. If the pith is not exposed, the borer can not make a ready entrance.

It is hardly necessary to add that the proper place for making cuttings is in a large shed, or under the shade of a large tree.

The following are the main points in making cuttings:

(1) The operation must be performed in the shade.

(2) The shears should be very sharp.

(3) Large and small cuttings are best made at the same time.

(4) Grade the cuttings as soon as made.

(5) The cut to be made in the joints where the wood is solid.

(6) The larger cuttings to be placed in boxes, with the butt ends all in one direction.

CARE OF CUTTINGS AFTER THEY ARE MADE.

Many failures arise from want of care of the cuttings after they have been made. A cutting should be fresh, or at least full of sap, before planting in nursery or orchard. The best method is to plant the cuttings as soon as they are made. If this be done they should not be disturbed from the boxes in which they were placed after being cut; and to transfer the boxes at once to the field will save work, and the chance of mixing the cuttings will be less. If planting can not be done immediately, the cuttings should be heeled in. This may be done by digging a trench as deep as half the size of the cutting, the soil being thrown up always on the same side, and toward the south if possible, thus forming an embankment, making the trench twice as deep. The cuttings are then put in slanting, with their tops leaning against the loose soil. The soil to be used for covering the trench is dug out of the opposite side and from the next trench to be dug. First the lower part of the trench is filled in, then loose soil is heaped in around the cuttings to within a few inches of their tops. Another layer of cuttings is then put on against this soil, the original trench all the time being made wider. The cuttings should not protrude more than a few inches. Thus heeled in, the cuttings should be kept slightly moist, but not wet. If too moist the cuttings will make root quickly. This is to be avoided as much as possible, as these roots will all die in replanting and rob the cutting of considerable sap and life force.

If there is danger of the cuttings rooting too soon they may be taken out and dried in the air for a few hours or longer, according to the weather, and then afterwards be put back into the trench. Such drying does not injure the cuttings, provided proper care is taken in not drying too much. In this manner cuttings may be kept in good condition for several months and until very late in the spring. The soil in the trench should be kept firm in order that the drying winds may not enter or that mold may not form. After every watering the holes formed by the settling of the soil should be filled in and trodden down. If the cuttings have from any cause become dry they should at once be revived. This can be done by placing them in a ditch or tub filled with water, running water being best. One night in water will generally revive most cuttings—that is, if they are not absolutely dead—and cause them to become plump again. Some cuttings in every lot are, however, irreparably injured by drying out, and these should, if the least shriveled, be thrown out at planting and no risk taken with them. If the variety is very valuable these injured cuttings may possibly be saved, and they should be cared for separately. The very small tips or single-eye fig cuttings should be allowed to remain in boxes, covered with moist or slightly damp sand in such a way that no part of them remains exposed. All such tips should be grown under glass or cover or in separate beds, where they can be given necessary care.

The following are the main points in caring for the cuttings:

(1) Plant, if possible, as soon as made.

(2) Do not expose to the sun.

(3) Heel in a trench, leaving not more than two eyes exposed.

(4) Tamp the soil in the trench so as to exclude the air and prevent drying.

(5) Keep moist, but not wet.

(6) Prevent rooting or callusing by occasional drying.

(7) Examine the cuttings every two days.

(8) Very short cuttings should be entirely covered.

(9) If dried out, revive at once by immersing in water or by covering entirely with wet soil.

(10) Never cover with wet straw.

(11) If callused when planting, cut off the callused part.

PLANTING CUTTINGS IN NURSERY ROWS.

Mark off the field by driving pegs in two parallel rows, the pegs in each row to be 4 feet apart. The best chain or line that can be used is five-ply twisted wire, generally known as "cable." After the pegs are set stretch the cable between two opposite pegs, and while the cable rests on the ground cut out a V-trench along the cable by means of the Italian broad hoe. In making the trench the flat edge of the hoe is slapped on the ground as close to the cable as possible and parallel to it. By pulling the hoe toward the workman a small trench is excavated which can be made sufficiently deep by twice repeating the stroke. Three men can perform this work to the best advantage—one at each end and one in the center of the cable. As soon as the cable is stretched all three men begin the digging of the trench. The cuttings should be planted by a separate gang of men as soon as each trench is ready. The planting is simple. The cuttings are placed vertically against the perpendicular side of the trench, about 10 inches apart, and sufficiently deep to leave one eye above the soil and one eye just in the surface line. As soon as a part of a row of cuttings is set, one man should follow with an Italian hoe and scrape the soil toward the cuttings. When he has caught up with the planter he should return and tamp the soil on both sides of the cuttings, not only by walking with one foot on each side of the row, but by using as much force as possible in pressing the soil hard. The soil can not be pressed too hard, provided it is not wet and soggy. If irrigation can not be had at once, or if the weather is very warm and dry, it is advisable to pull loose soil to the very top of the cuttings after the tamping is over.

This leaves only the very tops exposed or just in the soil, and prevents the cuttings from drying out. This entire covering over is also a most excellent way of reviving cuttings which have been planted, but which, from some cause or other, have become shriveled. A few days of shade will revive them, and the soil may be either pulled away again or be left. The sprouts of the figs will be able to push through if the covering is not over 2 inches thick.

In the directions above given the following points are to be noted as of special importance:

(1) Uniform distance between the rows.
(2) Absolutely straight rows.
(3) The planting of cuttings at once, after the trench is scooped out.
(4) Covering the trench at once after planting.
(5) Tamping the soil very hard.
(6) The shading of the cuttings by loose soil.
(7) Prevention of the exposure of more than one eye.

PLANTING SMALL CUTTINGS IN NURSERY.

The planting of very small cuttings of 4 to 6 inches in length should be done in low beds in irrigated districts, or, if in moist places, in elevated beds. The low beds should be absolutely level and surrounded by a low ridge in order to check the water which is to be conducted by a small ditch to the bed in such a way that the whole bed may be flooded at once. After the bed has been prepared the soil should be dug up and raked loose. A small V-formed trench is then excavated from one end of the bed to the other and the cuttings placed in this about 3 inches apart. The whole bed is filled with cuttings in this way. Only one eye of each cutting should be left out of the ground. When planted the bed should be flooded at once and covered with well-rotted straw in which all seeds have been destroyed by fermentation. Fresh straw will bring too many weeds and will, besides, injure the cuttings by attracting and reflecting intense sun heat. Such beds of cuttings are apt to dry out very quickly and require a great deal of water. If properly cared for they will make fine but small trees, suited for planting in nursery rows the following season. During the growing season the plants should be suckered and only one shoot allowed to grow. The terminal buds of the plants should be kept growing until the latter part of September, when they should be checked by keeping dry. (See fig. 20.)

The following points are to be observed in planting small cuttings out of doors:

(1) Plant in beds absolutely level.
(2) Expose only one eye.
(3) Keep constantly moist.
(4) Cover with well-rotted straw.
(5) Allow only a single shoot.
(6) Allow no growth after September.
(7) Observe the terminal bud daily, and irrigate the moment the growth is checked, which is indicated by the "heart leaves" becoming stunted and dry.

PLANTING SINGLE EYES.

The fig propagates readily from single eyes. Those that are saved in pruning and in making cuttings should not be allowed to be kept covered more than two days, as they begin to callus almost at once, and when once callused they do not readily stand moving. The best place for planting single eyes is in a frame covered by glass, canvas, or laths. Make the bed very level and water freely. The soil in the bed should consist of three-fourths pure sand, but should not contain manure. Plant the eyes about 3 inches apart each way and cover the eyes about 1½ inches with sharp, pure sand. Do not water for several days; keep only moist, not wet. The eye should be placed horizontally. The single-eye cutting is made either by cutting the wood across on each side of the eye, thus preserving the thickness of the wood intact, or by splitting the wood lengthwise. In the latter case the whole of the flat surface will callus and root. (See fig. 20.)

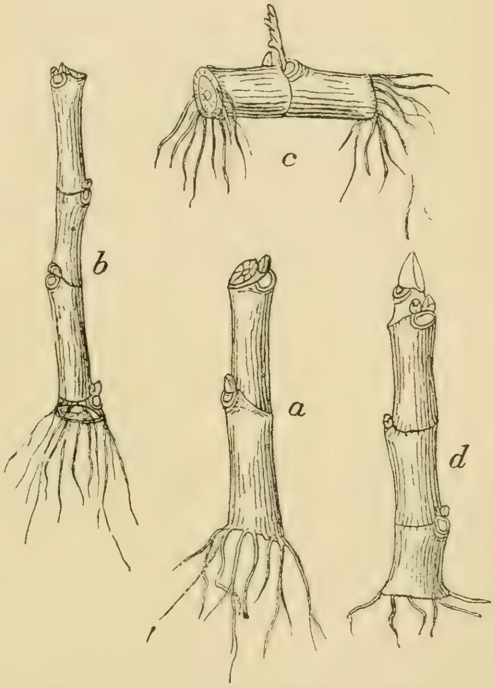


FIG. 20.—*a*, *b*, *d*, Small rooted cuttings of figs; *c*, a single-eye cutting.

The object in planting single eyes is simply to procure plants of rare varieties. For ordinary kinds it is not worth the trouble to save the small cuttings or the single eyes. A cutting which is badly dried should first be soaked or revived, then the eyes cut out as above and planted separately. This is preferable to planting any of the dry wood.

SUCKERS.

Figs may be propagated readily from suckers or so-called water-shoots, which spring up in abundance at the base of older trees. Such trees will bear as much and as good fruit as those grown from cuttings, but they are supposed by some growers to produce a greater quantity of objectionable suckers, which must be removed several times during the year. For cuttings such suckers are not as well suited, as the wood is very long between joints and generally is less well matured than the regular branches. Cuttings from branches are therefore to be preferred. When suckers are used they should be treated exactly like cuttings or rooted trees. When suckers are planted directly in the orchard care should be taken to set the butt end containing the few rootlets sufficiently deep in order that it may not dry out. It should be set just as deep as one would plant a cutting. The top of a sucker need not be cut back, but may be left a foot or two above the soil, just like a tree, provided, however, that it has been detached from the mother trunk with at least a few adhering rootlets.

BUDDING AND GRAFTING.

GENERAL REMARKS.

The fig may be either budded or grafted, preferably the latter; but there is little advantage in doing so, except when it is desirable to change a tree of one variety into another more desirable, or when it is found advantageous to give a weak-growing variety a strong and vigorous root and stock. Nurseymen's fig trees intended for sale are never grafted or budded, but are always grown from cuttings. Many people mistake the suckers of growing trees for suckers from the root below a supposed graft. Such suckers differ always somewhat in leaf from the older branches, but unless it is known with certainty that the tree is grafted it is safe to assume that the strange-looking suckers belong to the same kind as the parent fruiting tree.

The time for budding and grafting is in winter, when the sap is comparatively dormant. Fig trees, unlike other trees, are never entirely dormant, and in order to succeed in grafting it is of importance to have as little flow of sap as possible, else the sap will throw off the bud.

BUDDING.

Fig trees are seldom budded, as grafting is much preferable. Still, if budding is desired as a curiosity it may be done. It is believed, however, that budded trees will not make as strong trees as those grafted. Both in grafting and budding the fig the same operation must be had as in budding and grafting the walnut. A few remarks regarding budding may suffice. The best form of bud to be used in budding the fig is the ring bud. The first operation is to girdle the branch which is to be budded, making the girdle cover the site of an eye. Then take from the scion a girdle of exactly the same width and place this in position on the branch in place of the one removed. It is always best to place the new bud exactly over the spot where the old one was located, or, in other words, the ring bud taken from the stock is replaced by one as similar as possible from the scion. If the old branch is larger than the new one from which the bud is taken, enough bark should be left on the stock to allow the new bark to touch everywhere. The ring bud must fit exactly the place from which the bark was removed, especially at the upper margin and at the back. After the bud is inserted, tie firmly with cotton twine and wax well and do not cut back the top until the new bud has fully taken and grown several inches. Then cut back to one bud above the new bud. Destroy this upper bud by pinching, leaving only one leaf to draw the sap. After the new bud has grown several feet this old top may be entirely removed, either at once or during the following winter. In order to insure success the air should be well excluded by grafting wax from both buds and grafts.

GRAFTING.

If proper care is taken, the grafting of fig trees is not a difficult matter. Both scions and stock should be as dormant as possible, the best time for this being in January, though grafting may be done as late as in March. Only poor success will be had in grafting after the leaves begin to show and the sap flows readily. The following account of grafting the fig is mainly based on the experience of Mr. John Rock, who has brought the grafting of fig trees to great perfection.

SCION.

The best scion or wood is two years' wood, because it possesses less pith than one-year-old wood. End grafts or scions with top bud are the best. The form of the scion must be wedge-shaped, not only from top to bottom, but from front to back, and only one of the surfaces cut must show any pith. The side of the scion is placed toward the center of the stock, while of course the other side of the scion, which shows no pith, is placed toward the back or outward side of the stock. In order to have the scion properly cut the pith on the one side must be situated very low down, near the bottom of the scion. If situated higher up, the other side is sure to show some pith, too, which will be greatly detrimental to the future tree. (See fig. 21.)

Incipient fruit buds must be nipped off from the scions. The scions figured are of natural size and exact copies of those actually in use.

Terminal scions are the best. If other scions are to be used, the top cut should be made one-half inch above the top bud. This cut should be somewhat slanting. The front part of the wedge—that is, the part or face with the most bark surface and the one which when inserted will face outward — must have a bud at its upper end. Thus, in making the scion, begin by placing the knife close to a bud and then draw the knife downward. This is best seen in the illustration.

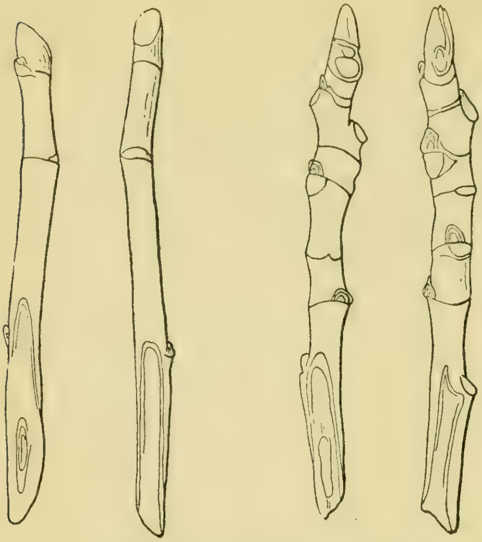


FIG. 21.—Fig scions for grafting—John Rock's method.

STOCK.

Any limb of an old fig tree may be grafted, provided it is healthy and not sunburnt. The limb is cut squarely off or slightly slanting. The best size of limbs is probably about 2 inches in diameter. The cut should be made at a joint, as there is less pith there than anywhere else. This cut is best made with a saw. Many cuttings may be grafted into every tree, but it is of the utmost importance that, according to the size of the tree, one or two branches should be left entire, in order that the sap may be drawn into the old tree. (See fig. 25.) If all the branches are grafted and no large branches left untouched the old tree will die through the stagnation of sap. In old trees one or two large branches are left. In smaller or very small trees it will suffice to leave some twigs or slender yearling branches to draw the sap.

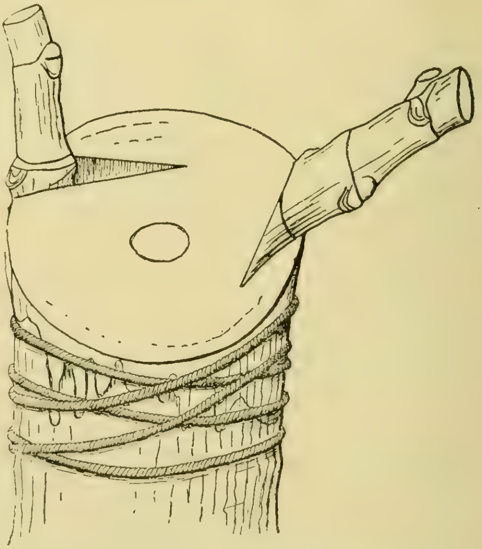


FIG. 22.—Scions inserted in a fig branch—John Rock's method.

CLEFT.

Smaller stocks require only one graft, but in the larger ones it is best to insert two or three grafts. Each graft is inserted in a cleft. This cleft, or slot, should be made with a knife or wedge and not with a saw, as the latter will make an uneven surface. The direction of the cleft should not be exactly parallel with the long axis of the stock, but should form with it a small angle, pointing toward the center of the branch, and it should not be so long as to cross the center. If pointing straight downward it will cause the stock to split, and if it crosses the center it may also cause the stock to split off. At any rate, it will not be properly kept in place. On the other hand, the upper part of the cleft, which crosses the cut-off surface of the stock, must not go through to the bark on the opposite side of the stock. The cleft is made on one side of the center, between the pith and the bark (see fig. 22), and must on no account cross the pith. If this is done the tree will be ruined.

INSERTING THE GRAFT.

When the scion is properly inserted in the stock it will show the following features: Its lower wedge-shaped part will point slightly toward the center of the stock and the median longitudinal diameter of the branch. The upper free part makes a small angle with the squarely cut-off surface of the stock. Thus the scion and stock are not parallel. At the junction of the scion and the stock is situated, facing outward, the lower bud or eye of the scion. Of the two planed-off surfaces of the scion, the one with the pith faces inward toward the pith of the stock. The inner green layer, or cambium, of scion and stock must touch at several points. (See fig. 23.)

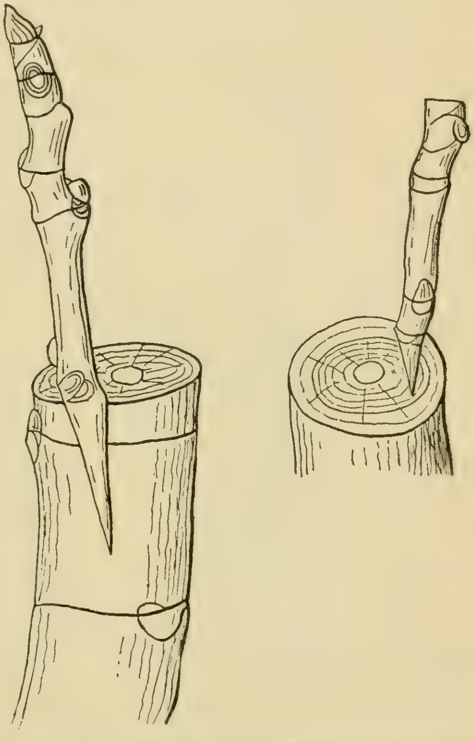


FIG. 23.—Two fig branches, showing manner of inserting the scions.

TREATMENT.

The scion is firmly tied with cotton twine, and the upper surface of the stock as well as the lower part of the scion must be well covered with grafting wax in order to fully exclude air, rain, damp, and wind.

After growth has begun, all the eyes of the scions should be allowed to grow for several months, but when they get to be too large and when there will be danger of the grafts being blown or broken off, the new, young, green wood must be cut back in such a way as to steady the graft. The growing branches of the graft must be tied to stout stakes, two, three, or more of which are required at every tree. (See fig. 27.) If the growing branches of the grafts are not tied securely they will with certainty blow off or break off by their own weight. These stakes must remain during the whole first year. When the scions have grown and attained one year the large or small branches of the original stock which were left to draw sap may be cut off or grafted, if necessary. After the scions have started to grow well it is necessary to cut open the strings with which the cleft was tied, or they will cut into the wood. Then new strings are tied and new wax is put on as before. The cutting back of green wood and branches should be done gradually.

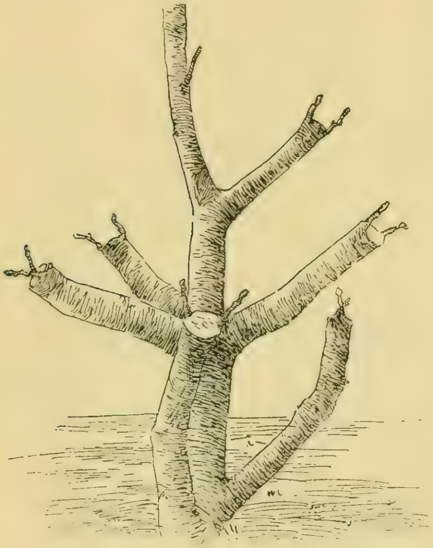


FIG. 24.—Fig tree just grafted. One branch is left to draw the sap. The straw covering to protect the tree has been omitted.

PROTECTION FROM SUNBURN.

It is of the utmost importance that the trunk of the old fig tree or stock should be covered with tule or flag, or otherwise protected, on the south and west sides, or sun, wind, and borers will ruin the tree. The fig, while a tropical tree, will not stand the exposure of its bark to the sun or wind, except in winter. It shares this peculiarity with most evergreen trees. (See fig. 26.)

SHIPPING CUTTINGS.

Fig cuttings are much less susceptible of being damaged in shipping than fig trees with large, developed roots. If accidentally injured by drying, they may be revived more readily than fig trees or most other kinds of cuttings. In shipping long distances great care should be taken in proper packing. If properly packed fig cuttings may be consigned on a voyage of three or four months and arrive at their destination in good condition. The style of packing must vary according to the distance and time of voyage, and also according to whether the cuttings are to be sent by mail, by freight, or other conveyance. In shipping cuttings to localities within one or two days' journey no special care is required. The cuttings should be tied in bundles of 50 to 100, as may be most convenient, two stout baling ropes being required, and tied one at each end of the bundle. A sack should then be slipped outside of the bundle, and if the weather is warm and dry, straw should be packed tightly between the cuttings and the sack, and the bag then stitched up. Dry-goods boxes may in some instances be preferred to sacks. Damp straw may be used for a week's trip, in which case a box should always be used. For longer distances the cuttings should be packed in dry charcoal and sealed in tin or in moss. The former is a most excellent packing and safe for a two months' journey, but has the fault that when the boxes are opened at the custom-house the charcoal will run out and the cuttings quickly dry. In all such cases the use of sphagnum moss must be substituted for charcoal. This moss is sold in pressed bales, is comparatively very cheap, and weighs but little. The moss is first made quite wet with water and then squeezed dry with the hands or by a press. A tight box is selected, the sides of which should be braced and bound with light irons. Along the inner sides of the box nail oiled paper, folding the paper in the corners. Put first a thick layer of squeezed moss in the bottom of the box, then a layer of cuttings, then a less thick layer of moss, another layer of cuttings, and so on. A thicker layer of moss should be placed on the top similarly

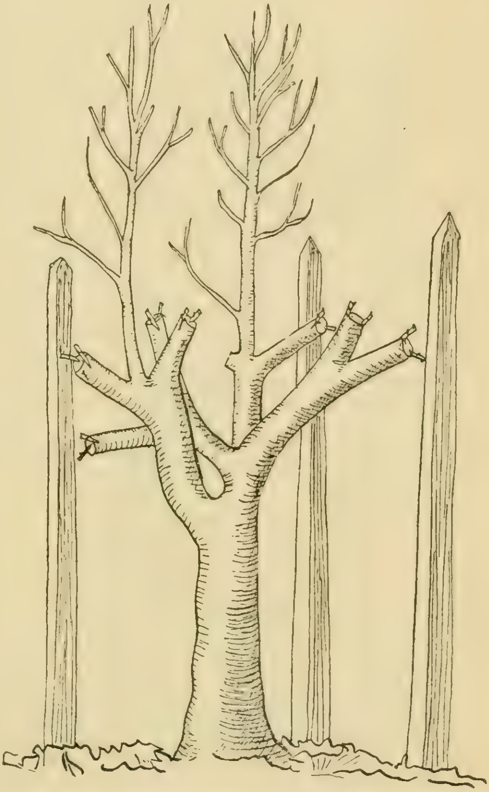


FIG. 25.—A fig tree just grafted. Two branches are left to draw sap. There are three stakes for supporting the growing scions. The straw or flag covering necessary to protect the stem of the main tree has been omitted.

to that on the sides, and all should be covered with oiled paper. Another good way is to tie the cuttings together in small bundles of 8 or 10, and treat these bundles as single cuttings. A more solid packing is the result. Very large boxes should never be used. A box 1 foot wide and 1 foot deep by 18 inches long is of a good size, is easily handled, and not readily broken. When the top is screwed on and the box turned over there should be no shaking inside, but all should be perfectly solid. A yet safer way is to cover each little bundle with plenty of moss, then outside of the moss wrap a stout paper, oiled or paraffin paper to be preferred. The bundles are to be kept steady in the box with plenty of moss. The points to be especially observed are to squeeze the water out of the moss well and to pack so that the cuttings will not move. If they move in the beginning they will do so to a greater extent as the moss gradually dries, and the cuttings will dry through the air admitted to the box. Cuttings well packed in very small boxes or in oiled paper and moss may be safely sent by mail, and will not dry out for one or two weeks. Such bundles must be tied very solidly. It is always preferable to dip all cut and exposed surfaces in melted wax, grafting wax to be preferred. This of course prevents the cuttings from drying out rapidly and insures greater safety. If a few cuttings only are sent, each one should be sealed with wax, and then wrapped first in paraffin paper and then in tinfoil.

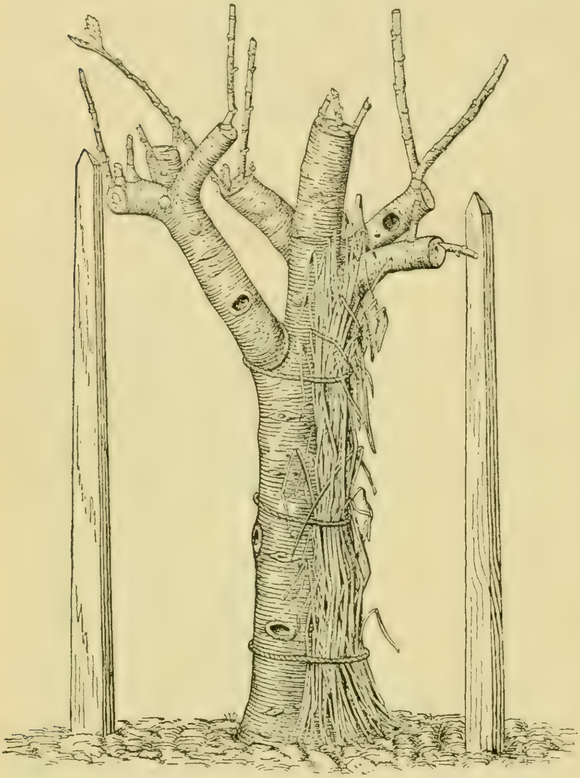


FIG. 26.—A grafted fig tree second season from grafting. Most of the scions are 1 year old from the graft and have just been cut back. Several small scions have just been inserted in the branches which were left growing to draw sap during last year. John Rock's method.

SHIPPING LARGE FIG TREES.

Large trees suitable for planting are generally sent in bales, covered with flag, tule, or straight straw. First, place on the ground or floor at least five pieces of baling rope, each with an eye knot at one end and of sufficient length to go around the bale. These ropes should be laid parallel and about 12 inches or less apart. Across these ropes place a thin layer of straight flag, tule, or long straw. Upon this heap a lot of common fresh, damp straw about 2 inches thick. Upon this straw lay the trees, with the roots all toward one end, and if the fig trees are not very large place some of the smaller trees with the roots more toward the center, in order to make the bundle more cylindrical and less conical. Cover the trees with a thick layer of straw, then bring the straw and flag together to the top of the bundle over its sides and rapidly pass the ends of the ropes together, so that each rope forms a slipknot around the bundle. It takes two men to make such a tree bundle, though it may be made by one man if he is skillful and if the bundle is not too large. The ropes should be drawn as tight as possible. Nurserymen use several mechanical appliances for making these bundles. None, however, have impressed the writer as being very practicable. After all the ropes have been thoroughly tightened, two ropes should be run lengthwise, connecting the cross ropes with one another so that they may not slip off. Finally, the straw and flags protruding unevenly are trimmed off with a sharp knife. The bundles are dampened by water if the weather is warm and dry. Such bundles, if solid, will stand a voyage of a week or two in winter time in moderate climates, but in cold weather they are liable to be frosted. It is hardly necessary to add that the bundles should be kept shaded as much as possible and not exposed to wind or sun.

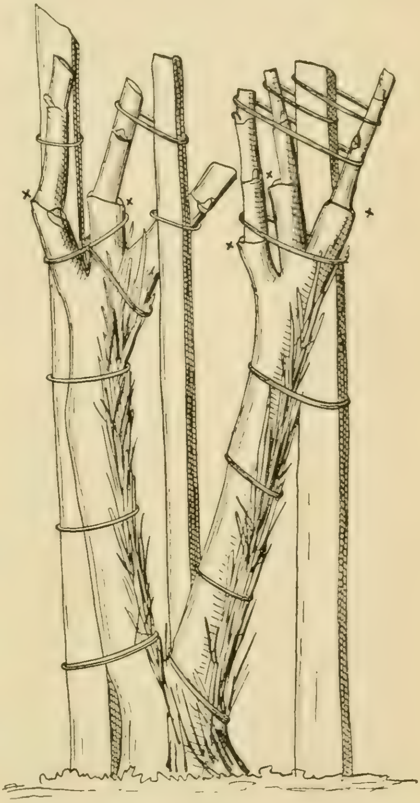


FIG. 27.—A fig tree second year from grafting. The scions have just been cut back and have been tied to the supports in order to prevent breaking from the main stem. The trunk of the tree is covered with straw.

For longer distances moss should be used freely between the roots, or, if the trees are very valuable and the distance long, damp moss may be tied around the roots of each tree separately and the trees either baled or packed in tight boxes. It is a good plan to first dip or puddle the roots of the trees in a wet mixture of clay and cow dung, thus covering the roots with a crust, which will add greatly to their protection and prevent mold or rot from setting in from the outside. The main point in packing is to exclude air. Pack damp, but not wet, and so securely that the trees and cuttings can not shake or change place. Straw is always less valuable than moss for packing, as it brings mold and rot, while moss keeps fresh and alive, even under very adverse circumstances.

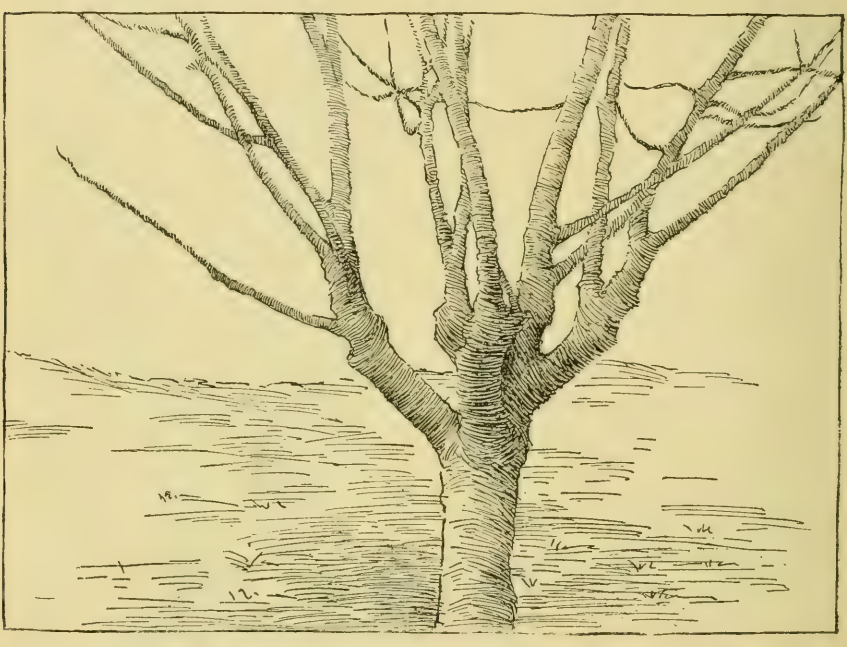


FIG. 28.—A grafted fig tree, three years from grafting.

HOW TO TREAT INJURED FIG CUTTINGS.

Valuable fig cuttings which, through poor packing or by accident, have become very dry may be saved by extra care. Such cuttings, even if apparently dead, should not be thrown away. The process described here for restoring fig cuttings has been tried by the writer several times with complete success. Slightly modified, it may be applied also to almost any other variety of cuttings, such as olives, etc.; but the success is never as great as with figs. Procure a deep earthenware dish and fill with as hot water as the hands can possibly bear and immerse the cuttings completely. Cover over with sacks or blankets in order to retain the heat. If in two hours the cuttings show no marked improvement, renew the water and make it as hot as before. But if an improvement is seen, renew with somewhat cooler water. The cuttings should remain immersed for twelve hours or overnight, after which drain off the water, rinse the cuttings, and transfer them to a box. Fill the box and pack as tightly as possible with moist sand. The box should then be placed in a hole in the ground and covered at least 2 feet deep with fresh soil. In twenty-four hours the cuttings may be taken out. If there was any life left in the cuttings they will now have sufficiently recovered to be planted. If they yet remain dry there is but little hope, though if very valuable they may again be transferred to water as before and given another trial. The writer has in this way revived cuttings which were pronounced dead and which when cut did not show any sign of sap. Such revived cuttings must be planted and cared for in an entirely different way from other cuttings. They should never be planted in the open ground, at least not at once, but must first be started under glass in a low frame placed directly on the ground. The frame should be slanting toward the north and covered with thickly whitewashed glass. The soil should be very sandy, and a layer of pure sand should be placed over the soil in such a way that when planted the bottom end of the cuttings will rest in the sand, but immediately over the soil. Only living wood must be planted. As soon as the cuttings are planted with only their tips protruding over the sand, the frame may be well watered once and then covered. After that no more watering is required, as a single additional watering may prove fatal to all the cuttings, until they have started and grown several inches. The glass should not be lifted, and no extra air is required until green leaves begin to show. The main point is to keep the frame cool and as dry as possible without allowing the cuttings to suffer. As a rule, even in very warm and dry weather, the frame will retain its first moisture for a month or more. The least excess of moisture will cause the cuttings to rot. Of course the young plants can not be removed until the next season. It is of very great importance that no dead wood should be left and planted, and such cuttings only should be used which show a flow of sap, and even if the sap be faint and watery the cuttings should be planted. The sap will in a few days become milky if the cuttings grow. If dead wood is planted it will draw upon the sap supply and finally rot, even if the eye has started and made a shoot. Such cuttings should, if possible, be cut to a joint. In watering such cuttings care should be taken in using only very pure water from wells or springs, as ditch water is likely to produce rot or other fungus growth in the bed.

SEEDLINGS.

Figs may be grown readily from perfect seeds; but, as only caprificated figs, or figs which have grown close to caprifigs or to figs with male flowers, have fertile seeds, it is necessary to use seeds of imported Smyrna figs or seeds from figs caprificated in this country or elsewhere. Cut open the figs and remove all the pulp by washing out in warm water. Seeds which float are empty and worthless, while those which sink are generally fertile. Sow the fertile seeds in shallow boxes containing sand and loam mixed and place the boxes in a frame under glass or canvas. The proper time for this operation is in the spring. In three weeks the seedlings will appear above the ground, and from that time on they must be sparingly watered. The next season they should be set out in nursery rows, the rows 10 inches wide and 4 feet apart. In three years such plants will be found to bear, but they will not necessarily mature the fruit. Very few, indeed, of these seedlings will produce valuable fruit. The majority will give fruits with male flowers, which are always a drawback to the edible qualities of the fig, as they and their part of the fig receptacle never soften. The raising of figs from seed is an interesting process, and by chance some valuable figs may be produced in this way. But, as there are several hundred fig varieties known, it is better first to experiment with them rather than to try to raise new varieties. Unfortunately for the grower, fig seedlings will mostly revert to the wild fig or caprifig, which, of course, always is the male parent. It is not proven with certainty that more than one or two fig varieties of value have been produced from seed, though it is probable that a majority of our fig varieties have originated in this way. According to observations made in Italy as well as here, it seems that fig seedlings produce both regular caprifigs and figs with mixed male and other flowers. Smyrna-fig seedlings raised by the writer produced trees with purely female flowers and others which contained male flowers in various proportions and development. The experiments made by other horticulturists turned out in the same way. So far no edible variety of the common fig has been originated in California, and any statements of valuable varieties having been raised from seed in hothouses in England or elsewhere in Europe should be accepted with doubt.

While it may be unnecessary at present to raise seedlings from edible varieties in order to produce other edible kinds, it is not only not unnecessary, but highly desirable, that we should raise new varieties of caprifigs from seed of caprifigs. In this way we may procure new caprifig varieties which will be more suited to local conditions than any which we can import from abroad. The figs which we have named, respectively, Mitchell and Maslin are undoubtedly such chance seedlings which may prove of much value.

CHAPTER VII.

PLANTING A FIG ORCHARD.

GENERAL REMARKS.

The planting of an orchard includes several different operations, such as preparing the ground, setting the stakes, digging the holes, and setting the trees, as well as their care immediately after planting. As all these processes are of importance and should be intelligently performed, they will be considered separately.

Opinions differ in regard to these operations more than in any others pertaining to fig culture, and the respective horticulturists use different means by which the same object is more or less speedily and properly attained. Most of these methods employed in planting a fig orchard are equally applicable to the planting of any other fruit trees. Still, the fig tree possesses peculiarities which must be considered and humored in order to attain success as speedily and practically as possible. These peculiarities of the fig consist principally in growth and habit, in mode of bearing, in aptness to break down, in susceptibility to heat and dry winds, etc. In this respect the fig tree stands almost isolated among fruit trees and shade trees. One theory holds that the fig tree should be treated very much like a wild tree, and that, because in many places in the Old World fig trees are allowed to take care of themselves and to grow as they please in odd corners, they should receive no serious attention—especially so the caprifig tree, which should be left to nature as much as possible. Like so many other trees, the fig tree may be planted almost anywhere and in any way and still give fruit; but, in order to insure the greatest success as much care should be given the fig tree as to any other fine variety of fruit.

The tree which comes nearest to the fig as regards horticultural peculiarities and wants is undoubtedly the olive, though it differs widely from the fig in many respects; but in planting and care these two trees require very much the same treatment.

DISTANCES FOR FIG TREES.

Of all our fruit trees the edible fig tree requires the greatest amount of space in the orchard. Much, however, depends upon the variety grown. Small-growing kinds like the Brunswick, the Ischias, Marseillaise, and a host of others will thrive with 25 to 30 feet between the trees, while others like the Mission, the Adriatic, and the Smyrnas require 50 or 60 feet, the latter being the distance now generally adopted in Smyrna. Where smaller crops are grown between the trees, the larger distance may be given at once, as it will allow ample room for intermediate plantations for years. But where no such crops are contemplated the trees may be set at first 25 feet each way, with the intention to ultimately remove every other tree in each alternate row, while every other row must be removed entirely. But this leads of necessity to great waste of trees, as two-thirds of them will have to be removed in order that the remainder may be 50 feet apart. In selecting the distance we must be guided by the variety, not alone in respect to growth and size, but perhaps principally by the quality of the fruit. It frequently occurs that fig trees while comparatively young give most excellent and sweet fruit, while a few years later the fruit sours and spoils as soon as fairly ripe. This to a great extent is caused by the crowding of the trees, by too much moisture, by want of air and sunshine and room to breathe. Different varieties act very differently in this respect. Thus our Black Mission fig will stand crowding quite well without souring its fruit, while the figs of the Adriatic will inevitably spoil as soon as the trees begin to shade one another sufficiently to keep out the wind and the sun. Thus the Adriatic figs and similar varieties must have plenty of sun and air, sunshine and air being especially necessary to the Adriatic figs. When exposed to constant breezes they can stand some shade without injury. In close plantings with a view to the ultimate removal of the superfluous trees, it must be remembered that by the time the majority has been removed the remaining trees will not have attained the size they would if given the proper distance at first. In places, therefore, where intermediate crops will prove profitable it will be preferable to give the trees the benefit of the greater distance at the first planting. Thus the largest-growing varieties should be given 50 to 60 feet, smaller or medium size 40 feet, and the smallest varieties 25 feet or even less, the Brunswick and Brown Turkey, for instance, being varieties which would thrive as long as they last with a distance of 20 feet.

The above refers only to fig plantations in districts where the trees attain their fullest development, such as in California, Arizona, in some of the Southern States, and in northern Mexico, etc. For localities where the fig tree can be raised only under difficulties no general rule can be given. For further information reference must be had to the respective places in this treatise where the various fig districts are discussed. The relative growth of the different varieties of figs is mentioned as far as known in the general catalogue of figs, and by consulting it some ideas can be formed of the distances to be given in the orchard.

DISTANCES FOR CAPRIFIGS.

The caprifig should always be planted closer than the edible figs. Ten or twelve feet apart each way is suitable, or the trees may be planted in the form of hedges around the main fig orchard. The most economical way is to crowd the caprifig trees into waste and otherwise worthless places where no plowing is required or need be done. The caprifig should be grown "wild." It should never be pruned, and had best be grown as a "thicket." The caprifig wasps require shade.

CARE OF FIG TREES BEFORE PLANTING.

Perhaps none of the operations pertaining to the planting of a fig orchard is of so much importance as the handling and care of the fig trees before they are set. A fig tree after it is dug up and before it is reset is more tender than almost any other kind of fruit tree, except the olive and the citrus trees. As a general thing it must be borne in mind that when once the roots of a fig tree have become injured by drying or sweating they had better be cut off and the remainder of the tree treated as a cutting. A cutting will always grow better than a fig tree with injured roots. The planter should therefore satisfy himself when he buys trees that these have had the proper care, and that they have not been exposed to sun and wind for more than five minutes. This can be prevented easily by covering the fig trees in the field with sacking or blankets, which should be kept wet or damp. As soon as the trees have been received from the nursery they should be heeled in, and care should be taken that the soil is moist, as dry soil will quickly kill the trees. It is always advisable to heel in the trees close to a ditch, or close to water, and if a ditch or reservoir is handy the tree bundles should be immersed before the ropes are cut and the bundles opened. The trees can profitably rest in the water overnight if necessary. In heeling in all ropes should be cut and the trees spread in the trench in such a way that the soil thrown in will surround all the roots, not leaving passages for the wind, or perhaps sun, to enter and dry the trees. Even if the intention is to plant in a few days this mode of heeling in should be followed. Heeled-in trees should be watered and the soil kept firm. If planting is delayed and the trees have become somewhat dry, which can best be ascertained by examining the end buds, the trees should be at once taken out, immersed in water for six or twelve hours, and heeled in very slanting and deep and covered with soil to near the tops; but care should be taken not to cover the tops entirely, as this may cause the trees to rot and will prevent examination of the buds.

If fig trees show signs of starting they may be kept back by exposing to the wind for a few minutes in the shade and again heeled in. This operation, if performed properly, is not dangerous and is quite effective, but it should not be done except in emergency, as the trees will of course suffer to some extent.

PREPARING THE SOIL.

The preparation of the ground for the future fig orchard differs in nothing from the most approved methods used for ordinary orchard lands. The more thoroughly the ground is prepared the less will be the cost of driving stakes, digging holes, and setting the trees, as well as the final irrigation in dry localities. When irrigation is necessary the work on the ground begins with leveling the land. It will greatly cheapen after-culture if this leveling is carefully done. In order to ascertain that this has been done there is no better test than to irrigate the ground before the trees are planted. The soft places will then settle and may be filled in again. Even if irrigation in furrows is contemplated, the surface should be level enough for flooding, in order to insure an equal quantity of water to every tree and to save water and economize labor. After the trees are planted no leveling of the soil can be properly done. Ten dollars more per acre spent in leveling before planting will save perhaps $10 to $20 yearly afterwards, besides insuring an even growth to all the trees. In places where no irrigation is needed some attention should still be given to the preparation of the surface, both to prevent stagnant water during the rainy season and to cheapen and facilitate the yearly working of the soil.

After leveling is done the plowing should begin as soon as the surface is properly dry. On no account attempt to plow when too wet or when too dry. The dry soil when turned under is liable to come in direct contact with the roots of the trees and cause them to dry out. The soil when turned over should break up finely, neither forming dry clods nor wet cakes. The soil when turned up must be moist, and the soil immediately below the plow should be yet moister, but not soggy.

In plowing, the team should not be made to go all around the field, plowing toward the center, as this will leave two streaks of hard soil diagonally across the field in the shape of a Greek cross. The proper way is to plow the field in separate lands, from one boundary line to the other, making the turning always in the road which surrounds the land or field, and not in the land. In this way no hard soil will be left unplowed, and when the plowing is over the whole ground will be found plowed in parallel furrows. The harrowing should be done in the same way, but in the opposite direction, and the turning should be made on the land. Two or three harrowings will not be too much, as the more the surface is harrowed and pulverized the better will its condition be for receiving the trees and the cheaper will be the final operations of the planting.

In districts where the fig flourishes most and gives the best fruit no irrigation is needed, and consequently the surface of the ground does not need to be level. Still it is of great importance that it should be sufficiently level to shed all water that may come by rain or flood.

There should be no low places in which pools may form. All such should be filled in and leveled sufficiently to prevent stagnant water remaining. Such low places will prevent and retard plowing, cause weeds to grow, delay work generally, or they may even cause the trees to tip over and rot. Hills and knolls are not objectionable, provided the trees find sufficient moisture to bear good fruit, but low and soggy places should be carefully avoided, as they will prove of great detriment for years and be a constant expense, annoyance, and eyesore.

This, of course, refers only to the planting of regular orchards, where thorough culture is necessary.

Points to be considered in preparing the soil:

(1) Freedom from low or stagnant water holes.

(2) Even slope, so as to shed water.

(3) Deep plowing and freedom from hard places left unplowed, accomplished by plowing in parallel lands.

(4) Do not plow under any very dry soil.

(5) Harrow repeatedly immediately after plowing.

STAKING AND SQUARING THE FIELD.

As soon as the land is in proper condition to receive the trees, the placing of the stakes is in order. Through experience it is found that the planting can be done quicker and more cheaply if the stakes are set previous to digging the holes for the trees. No holes should be dug nor trees planted until all the stakes are set. In this way any error can be remedied without redigging and resetting, and perfect lines may be had throughout the orchard. The extra expense in marking an orchard in this way is not great and will, it is thought, be more than repaid in better and quicker work and by a larger percentage of living trees. If a very large orchard is to be planted it will pay to have an experienced surveyor set parallel rows of stakes across the field, about 200 feet apart, between which the farm hands may afterwards set the remainder of the stakes without error. When no surveyor can be found the following rules will lead to the desired result: The first work is to square the ground—that is, to mark out the boundaries of the field in such a way that the opposite sides become absolutely parallel, and, if possible, form a right angle (90 degrees) with the other two parallel sides. If roads surround the place, and make right angles with one another, then it is necessary that the rows of trees should also form right angles with one another. If no important roads are found, or will probably be necessary in the future, then it is only required that the rows running in one direction should be parallel, as a small deviation from the right angle will not be seen, or if noticed will not prove to be a detriment.

The operation begins by first setting a row of lath along one side of the field, on the boundary of the orchard, or at least parallel to the boundary. By referring to the diagram (fig. 29) we should begin at A and set the stakes to B. This line should coincide with the first row of trees nearest the road. Then go back to A and set another row of stakes to C, this point being the extremity of the field in that direction. This row A–C should be at right angles with A–B if possible; if not, it should be parallel to the road at the end of the orchard. A small level, combined with a compass, is the best and simplest instrument to aid in laying out an orchard. Even without the level the correct lines may be laid out, but this requires a little more labor. After the point C has been found, begin at C and set a line of stakes, C–D, parallel to A–B. For this purpose the compass on a tripod should be used in order to get the point D at least approximately correct. The next work is to go back to B and set the line B–D parallel to A–C. The point D is the only difficult point to set, and upon the correct location of this point depends the lining of the trees. After the point D is approximately fixed, it is necessary to measure from B to D in order to ascertain if the distance is the same as from A to C, and similarly to measure from C to D to see if this distance is the same as that from A to B. If both the lines B–D and C–D are longer than parallels A–C and A–B, respectively, then the point D must be moved toward the center of the field, but if the above lines are shorter than these respective parallels, then the point D must be moved away from the center of the field. If B–D is shorter than A–C at the same time that C–D is longer than A–B, then the point D must be moved toward C. If, on the contrary, C–D is shorter than A–B at the same time that B–D is longer than A–C, then the point D is to be moved toward B. As the whole orchard depends upon this point D, it will

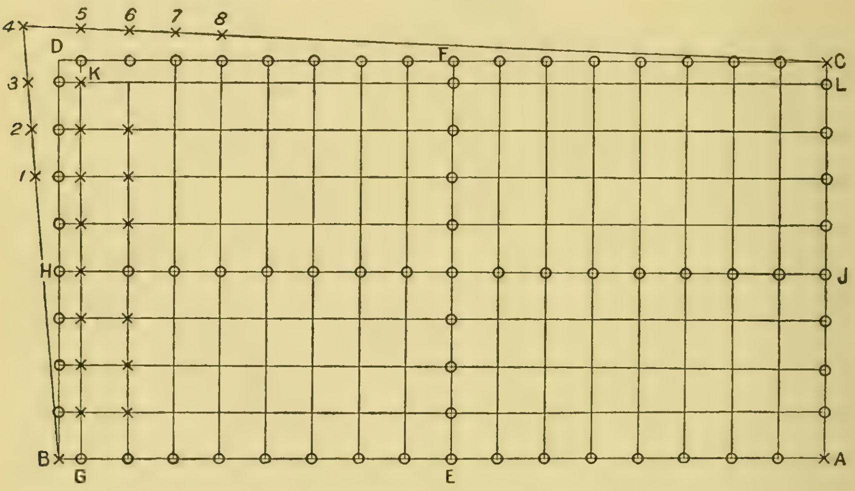


FIG. 29.—Diagram illustrating a farmer's method of laying out a fig orchard.

be profitable even to spend a day or two, if necessary, in order to locate it correctly. In all measurements begin at A and measure toward B or C. Or from C measure toward D, or from B toward D. If this rule is not followed absolutely the trees can not be made to line. When at last the point D is correctly located, A–C should be of the same length as B–D, and A–B of the same length as C–D. If the trees are to be in exact squares the angles at the respective corners at A, B, C, and D must be right angles. In fixing these preliminary points it is not necessary, nor indeed of advantage, to set many stakes. Three or four stakes in a line will be enough.

Next in order is to set the final stakes, one for each tree. Common lath is the best and easiest material to handle and procure for stakes. If the soil is in proper condition it is not necessary to point the laths. If the ground is hard and the stakes require to be driven, it may be necessary to sharpen the lath, but the points should be in the center of the lath, or as close to it as possible. Some, to save time, point the laths by cutting them diagonally across, but this is not proper, as in driving a lath thus pointed it will inevitably be shoved out of its place and get out of line. The sides of the points must be of equal length in order to insure accuracy. But in proper soil no points are required. Laths which are not pointed may be more readily used for other purposes afterwards.

Go back to A and stretch the staking cable from A toward C, and, measuring from A, set a lath perpendicularly every 50 feet (or less) toward C. A lath will thus be set at each small circle on the diagram. Similarly set laths from A to B and from B toward D and from C toward D. If the planting chain does not reach from A to B it will be necessary to set another base line of stakes between E and F, and possibly also between J and H. The next step is easily understood. By stretching the chain or cable between the opposite points and setting laths every 50 feet, the whole field will be quickly staked out.

In setting the laths two points are to be constantly remembered. The laths in the same row should all face the same way; all should be set on the same side of the cable—the side from which the cable is to be moved. In the accompanying diagram it will be seen that the field was not square, nor its sides exactly parallel. The space outside of G, K, and L may be filled out, where the room admits, with trees. On this diagram eight outside trees are possible. This filling out is done by sighting, as being the simplest way. In setting the stakes, always set the outside end stakes first and fill in afterwards, as in no other way can the line be made straight without the aid of a good surveyor's level.

The laths should be driven down with a hatchet deep enough to be entirely solid and immovable by wind. Loosely driven laths will be disarranged with astonishing facility. A small opera glass or field glass will be of great use while driving the lath. For this operation it takes at least two men—one to sight and one to drive and carry the laths. The sighter stands at one end of the line or row while the driver begins his work at the farther end. The driver holds first the lath perpendicularly over the mark on the cable, if there is one, and the sighter makes a sign with his hand indicating whether the lath is to be moved to the left or to the right, and when in line with the farther lath the sighter makes a sign of approval. The driver always works toward the sighter, not from him.

Number of trees or plants on an acre at given distances apart.

Distance.	Square method.	Equilateral-triangle method.
1 foot apart each way	43,560	50,300
2 feet apart each way	10,890	12.575
3 feet apart each way	4,840	5,889
4 feet apart each way	2,722	3,130
5 feet apart each way	1,742	2,011
6 feet apart each way	1,210	1,397
7 feet apart each way	807	928
8 feet apart each way	680	785
9 feet apart each way	537	620
10 feet apart each way	435	502
12 feet apart each way	302	348
14 feet apart each way	222	256
15 feet apart each way	193	222
16 feet apart each way	170	195
18 feet apart each way	134	154
20 feet apart each way	109	125
22 feet apart each way	90	104
24 feet apart each way	75	86
25 feet apart each way	69	79
30 feet apart each way	48	55
35 feet apart each way	35	40
40 feet apart each way	27	31

Rule.—Square method.—Multiply the distance in feet between the rows by the distance the plants are apart in the rows, and the product will be the number of square feet for each plant or hill, which, divided into the number of feet in an acre (43,560), will give the number of plants or trees to the acre.

Rule.—Equilateral-triangle method.—Divide the number required to the acre "square method" by the decimal 0.866. The result will be the number of plants required to the acre by this method.

DIGGING THE HOLES.

The stakes which have been set with so much care ought not be disturbed until all the trees in one field have been planted. Before digging the holes, the field should be gone over carefully in order to ascertain if all the stakes are in line. When all stakes or laths line in every direction without deviating an inch anywhere, the field is ready for the diggers.

If the orchard is of any considerable size, a digger should be made to keep his row and put his mark on the end lath, in order that it may be readily ascertained who dug the row. Whether done by contract or by the day, this is a useful practice, the diggers soon learning to be careful. The first move is to give the stake a sharp stroke with a flat face of the spade in order to drive it solidly in the soil. The hole is next dug on the side of the stake, close to the narrow edge of the lath. If, for instance, the first hole is dug on the east side of the lath, every succeeding hole must similarly be dug on the east side of every lath, otherwise the holes will not line with one another. As to the size of the holes, no general rule can be followed. The hole should never be larger than necessary to admit all the roots in their proper position. As far as the experience of the writer goes, a hole 18 inches deep by 2 feet wide will answer in most cases for all trees, as few trees from the nursery will have more spreading roots than this. However, the proper way is to first ascertain the length of the roots, both horizontally and vertically, and then dig the holes accordingly. A square hole is better than a round hole, as it enables the planter to so turn the tree that any extra long root may be spread out in the angles of the hole. In irrigation districts the hole does not need to be larger than to admit the roots. Actual experiments have proven that larger holes are not needed. Trees planted in very large holes, 4 feet square, did not grow better than trees set in holes of just sufficient size to admit the roots. In fact the shallow hole is better, because with subsequent irrigation the soil in the larger hole sinks or settles, causing the tree to stand too low. Irrigation softens the soil sufficiently to enable even the smallest rootlets to easily penetrate the soil.

In districts where no irrigation is required the hole may be made deeper in order to give soft soil to the lower roots, but in no case does it need to be wider than the spread of the roots. In such localities it is desirable to cause the roots to go down, but not to spread on the surface.

In digging, the top soil should be put in a small pile separate from the bottom soil. The latter had better be scattered at once over the field, as it is desirable to use only top soil in filling in around the roots. The bottom of the hole should not be tapering or funnel-shaped, but square and flat. Few trees indeed have taproots. A funnel-shaped hole will also cause all the heavy ground or clods to collect in the center, where it is greatly in the way in planting trees. The soil in the bottom of the hole should be stirred, in order to prevent it from drying out before the tree is planted.

PLANTING THE TREES.

The sooner planting is done after the holes are dug the better it is for the trees. The habit of digging holes weeks or months before planting is to be greatly condemned, as it causes the holes to dry out and become lined with a crust of dry and hard soil, which must be removed before the trees are set. The first operation in planting is to examine the trees in order to ascertain if the buds, wood, or rootlets are shriveling. Whether this be the case or not it is of great advantage to immerse the fig trees in running water, or at least in fresh water, overnight, previous to planting the following day. If the stem and buds are plump the trees may, however, be planted at once. Previously to planting, the roots should be trimmed with a pair of very sharp shears. The large roots should be cut back until they show the milky sap freely, all moldy parts should be cut off, and all rootlets which give the least suspicion of being dry, or which do not show sap freely, should be taken off entirely. It is better to plant a fig tree without any roots than to plant it with dry roots, as in the latter case the tree will die back to the ground. In bringing the trees to the field they should be wrapped in wet sacking or blankets. One man should carry the bundles and distribute the trees for about four planters, going but one or two rows, but better only one row, ahead of them, sticking a tree in each hole in such a way that as little sun as possible will strike the roots. If the sun is very warm and the wind blowing it is necessary to have one distributer for each planter, as the success of the planting depends absolutely upon planting fig trees with moist roots. In some cases it may be necessary even to carry a tank of water in the field and dip the fig roots before planting. In moist and cloudy weather no such extra precautions are necessary. It must be always remembered that it is cheaper to be extra careful in the first planting than to replant the following season. Few trees are as tender as fig trees, but with proper care no appreciable loss is necessary.

The mode of planting is to first fill in sufficiently with the top soil to form a small hill in the center of the hole. When placed upon it the fig tree should stand as deep in the hole as it stood in the ground in the nursery. The discoloration of the collar of the tree will show the former soil surface. The roots are then spread out and the tree turned so as to allow the longer roots to spread naturally in the angles of the hole. By means of the guiding lath the trees are all placed the same distance from the lath at the edge of the holes, and if this is done with precision the trees when planted will all be in exact line.

The roots are then filled around with fresh surface soil taken from the vicinity of the tree. If the ground is in proper condition the soil will be found moist an inch or two below the surface. This soil is used for filling. The soil is not to be shoved down by the spadeful on the roots, but gently shaken in by means of light jerks of the shovel or spade. It requires two men to plant—one to hold the tree in place and arrange the soil about the roots by means of a short stick, and one to shovel the soil and do the final tamping. In small plantings the distributer of the trees may be dispensed with and the trees in their wraps may be carried by the man who does not carry the shovel.

The soil should be tramped as hard around the roots as possible; the whole weight of the body as well as force should be applied on the soil. The hole should be filled in level with the surface, and in very rainy weather may be heaped, so as to cause the water to run off.

After the hole is nearly filled some loose soil should be thrown on top, in order to serve as a mulch. In very dry seasons the trees may be set a little lower than the ground and a small basin left around the trunk. The advantages of this system are many. It insures correctness in lining the trees, as the positions of the laths indicate the exact places of the trees before planting; it obviates the filling in and redigging of holes if dug in the wrong place; it makes the pulling out and resetting of trees unnecessary; it is a quicker and simpler method than the old one of using the guide board with one peg on each side of the hole, and, finally, it is a cheaper method than any other in use which insures absolute accuracy.

PLANTING CUTTINGS IN THE ORCHARD.

The planting of cuttings directly in the orchard differs but little from planting the trees. The same method should be followed, but the holes should be deep enough to suit a very large cutting. Such cuttings are the best to plant out, as they are more able than small cuttings to care for themselves. The cuttings should be allowed to protrude only a few inches above the soil, and in times of very dry and warm weather even the top may be covered with a small amount of soil to prevent drying out.

PLANTING TO AVOID SPLITTING THE TRUNK.

The fig tree is more liable to split than any other of our fruit trees. Pruning may greatly obviate this evil, but a much better way and, in the opinion of the writer, the only proper way to prevent fig trees splitting is to plant two cuttings in the same hole, the cuttings crossing each other in the center of the hole. This method has been employed in Smyrna for this reason, and also in France, with a slightly different object in view. The effect of such planting may be seen at once, as the only branches that split off from a fig tree are those which are too heavy for the tenacity of the wood. While the branches never break off entirely, they split from the main stem and always injure the tree, and often ruin it.

The more upright the fig trunk, the greater the pressure of the limbs and the more readily will they split off. The less horizontal and the more downward sloping the branch, the less it is apt to split away from the trunk. By setting two trees or two cuttings in one hole, with the tops a short distance apart, the two trees or trunks resulting from them will lean outward, away from each other, and so will all their branches. The effect will be that none of them will ever split away. In course of time the two trees will grow together at the base and form one large tree of the same form as that possessed by a wild fig tree, which is after all the most suitable shape that can be given a fig tree. In planting in this manner the tree or cuttings should be made to cross each other in the hole a little below the soil. This will give a greater inclination to the main trunks, which is just what is desired. In training such trees after planting very little labor is required. The trunks will bend out by themselves, and the branches of each tree will complement one another and form one uniform head or crown. No pruning is necessary, except to cut out some branches which grow too closely together. The interior branches will be comparatively very few, and the principal limbs will grow outward. Such trees require less pruning than those planted in the regular or orthodox way, as they will shape and care for themselves. This mode of planting should be adopted for all fig orchards. Fig trees destined to give shade in avenues and ornamental grounds may, however, be set singly.

CARE OF TREES AFTER PLANTING.

Whether the recently set fig trees should be irrigated or not must depend upon circumstances. If the soil be moist, irrigation should be postponed until necessary. The trees should be inspected every two or three days. When in proper condition the buds and the top branches should be plump and the outside scales of the buds should be full of sap if punctured or broken. If any of them show dryness, water should be applied at once, and if, after irrigation, no improvement is seen within a day, there is no alternative but to cut the trees back to the point where they will bleed freely. If, after being cut back, the tree shows signs of continuing to dry, it should be cut back close to the surface of the soil, in order that a shoot may be encouraged to start up and form a new tree. This cutting back to the ground may prove an heroic measure, but it nearly always has the desired effect of causing new shoots to form below the soil, whereas if a drying tree be allowed to remain unpruned it will generally die. Much complaint is heard from planters about fig trees dying, and many prefer on this account to set out cuttings instead of trees. But if this system of heavy pruning back is adopted at the first sign of drying the loss will be greatly reduced.

If the fig tree has been planted for shade and when it is desirable, if possible, to save the standard, this can often be done by closely covering the tree with sacking and excluding as much wind as possible and all the sun. It is wonderful how a sickly tree will recover if properly shaded and evaporation prevented. This process is applicable also to citrus trees and olives, and indeed to all evergreen trees. By watering or sprinkling the covering morning and evening the evaporation of the sap is considerably retarded. The roots should be kept moist, but not wet, for if too wet they will rot. After every irrigation the soil should be dug up and pulverized around the roots in order to admit the necessary air to the roots, as well as for acting as a mulch. The practice of mulching the trees with fresh yellow straw is to be condemned, as the reflection from the straw causes the sun to scald the bark of the tree. If straw is used at all it should be in conjunction with a tree protector of some kind—paper, sacking, or stakes, in order that the stem may be properly shaded.

DURATION OF PLANTATION.

The edible fig is known to have become several hundred years old, and it bears full crops for one hundred years or more. It is therefore hardly worth the while to consider the duration of a fig orchard, as it will last for two generations or more, and during this time will give an abundance of fruit. However, after a certain time it may prove of advantage to renew the trees, much depending on the way the trees have been treated and upon the soil in which they have grown. Some varieties will last longer than others and some produce their best fruit before they attain thirty years.

VARIETIES TO PLANT.

As regards varieties little can be said. Too little is known concerning the nature and adaptability of certain varieties to localities. No one should plant extensively until it has been fully ascertained that the variety selected is suited to the locality. In places where there are no experimental orchards it will naturally take some time to find the proper variety. Among common figs there are, however, several varieties which will probably do well in many localities. Such varieties are, for instance, "Le Roi" and "Marseillaise White." Among the true Smyrna varieties none is superior to Lop Ingir, the true fig of commerce. But even this variety is in places superseded by other kinds better suited to local conditions Whatever variety of Smyrna fig is planted it is of great importance to plant only a single variety, or at least to have enough of every variety to produce a large lot of uniform figs. An orchard of mixed fig varieties is troublesome and unprofitable. As the figs must be picked up all over the orchard from under the trees as soon as they drop to the ground it is impracticable to keep the varieties apart if there be more than one kind of fig. Where the varieties are mixed grafting will be necessary, and this will put back the trees and the crop from three to four years after the error in planting has been discovered. Of caprifigs as many varieties as possible should be set out in order to have a succession of figs. When it has been once established which variety is best suited to a certain locality, one or two varieties may suffice. The caprifig trees should be set by themselves in sheltered corners of the orchard. There is needed about one caprifig tree to every ten Smyrna fig trees.

CULTIVATION.

The cultivation of the fig orchard requires no implements which are not also useful in any other orchard. On the Pacific coast the orchards are now almost exclusively worked with horse power. In orchard culture riding two-horse sulky plows are generally used. Such plows have one or two shares or shovels, and are so adjustable that the shovels may be thrown close to the trunks of the trees. This can only be done while the trees are young, or where they are raised to medium standard high. In the smaller orchards smaller cultivators are used, the driver walking behind. Except in a few places so situated that horses can not be used to advantage, all the work done in our orchards and nurseries is done with plows and cultivators for two and four horses.

In the cultivation of the ground we should remember that the better the soil is cultivated the better will be the fruit. The first plowing should be done in the fall, immediately after the first rains, or in early spring. If the plowing is delayed to January, weeds, which by this time will have started everywhere, can be plowed under to advantage. Early plowing will facilitate the absorption of the rains. The plowing begins between the trees, the soil being thrown to the center. It is important that the bark of the trees should never be the least injured by running against it with the singletree. In order to avoid this injury the regular iron couplings may be superseded by couplings made of leather, which will slide smoothly over the bark without bruising it. When the trees become too large even to admit this, the center of the land is plowed with a sulky plow while the outside of the land nearer the trees is finished with a single plow. One single plowing is generally enough each year. Still one or more plowings afterwards may benefit the soil. There is no danger in cutting the roots of the trees, the cutting of surface roots being beneficial rather than otherwise, as it causes the roots of the tree to strike downward. Many orchardists follow the first plowing with a harrow. This is required only in places where the soil breaks up in clods. Where the soils turns up soft and mellow it is necessary only to follow the plowing with cultivation. The cultivator should be run both lengthwise and crosswise through the orchard after every heavy spring rain or after every irrigation, if such is practiced. The soil should never be allowed to bake or form a top crust. If the soil in the orchard is cultivated by a sulky cultivator three times or more during the summer it will not be necessary to plow against the trees at any time, as the soil naturally tends to level itself. But if cultivation is neglected, it is necessary to plow against the trees every other year or every other plowing. It is of the utmost importance that the soil under the trees should be loose and mellow. If hard and lumpy, the figs will be bruised when they fall ripe from the trees. If the soil is loose the figs are not injured by the fall. It may be necessary to plow furrows in the orchard for irrigation. Such furrows should always be as far from the trees as possible, their distance to be regulated according to the age and size of the trees. It may be necessary to use some hand work in the orchard when the trees come in bearing. This work is generally confined to loosening the soil immediately around the trunks of the trees and raking away the large clods so as to leave as smooth a soil as possible for the figs to drop on.

THE CREATION OF A FIG ORCHARD IN CALIFORNIA.

During the first period of fig raising in California and the other Pacific States—Arizona, Sonora, and Baja California, the latter two situated in Mexico—no special attention was given to the care and creation of a fig orchard. During the second period, when the early immigrants arrived in California and brought with them cuttings of figs from their homes in Italy, Greece, and Spain, some little attention was paid to the cultivation of the fig, especially for the purpose of supplying the market with the fresh fruit. It is only now, during the third period of the fig industry, after the introduction of the Blastophaga wasps by the United States Government, that more attention and care is bestowed on the fig. For the reader who desires to have a summary of the operations and processes necessary to create a fig orchard on the Pacific coast the following résumé may be of interest:

The first move is to select the site for the orchard, and upon its proper location depends the future success. The first condition to be considered is the absence of frosts during the spring, when the trees are in active growth. The second condition refers to the nature of the soil, its quality, drainage, facilities for irrigation, etc., points which have already been referred to more or less. Taking it all in all, deep mesa or table-lands are the most suitable to produce first-class figs in quantities that will pay. An atmosphere that is too dry is almost as bad as one that is too moist. Our river-bottom lands are ideal places, provided they are not subject to spring frosts. In such places the mesa lands surrounding the river bottoms are the best. In some localities it is necessary to go to the second mesas or table-lands in order to find the most desirable locality. The land should, if possible, be summer fallowed, in order to take up readily the first rain in the autumn. After the first rain the land should be plowed as deeply as possible, and a final cultivation should be made just before the planting. The deeper the soil is plowed and the more mellow it is, the cheaper will be the planting. After the last cultivation the land should be dragged with a wooden drag made of boards and loaded down with sand bags or stones.

The best time for planting is immediately after the first frost in the fall, or, if there is no frost, after the leaves of the fig trees have fallen. This is in December on the Pacific coast, earlier or later according to the season. The best success is always had from early planting, and in soils where early planting is not practicable it is advisable not to plant figs to any great extent. After the land is dragged, the first step is to stake the ground in the manner described elsewhere. The stakes may be set from 25 to 50 feet apart, according to the object in view. If 25 feet is decided on, it will not be advisable to grow any intermediate crop, except during the first year or two. If 40 to 50 feet is adopted as the distance, intermediate crops may be grown for many years, until the trees are 10 to 12 years old. In places where the land is very valuable intermediate crops are desirable, otherwise the greater distance is to be recommended at once. The trees or cuttings should be entirely fresh; if not, they should be soaked up in water until they show fresh sap when cut. Generally only one tree is set in each hole, but we have in another place recommended that two trees or two cuttings be planted in the same hole, 6 or more inches apart, in order to prevent splitting of limbs or trunk. If cuttings are set, they should be at once covered with soil in such a manner that the upper surface of the cutting is just below the soil surface, the soil thus forming a small hill around the cutting, which need not be more than 6 inches above the general level of the ground. If trees are set, they should at once be cut back to within a foot of the ground and then covered with soil in the same manner. If the trees are left higher, they should be covered entirely with flag, tule, or straw matting, in order to be protected from sun, wind, or drought generally. If irrigation is practiced, the trees should be irrigated at once, except in case of heavy rain.

The next step is to watch the young trees or cuttings and see that they do not dry out. This watching should be done every three or four days. Uncover the soil and cut the bark; if sap exudes the cutting is all right; if no sap comes out, irrigation is needed at once. In case of trees which show dry tops, these latter should be at once and without hesitation cut back to flowing sap. A pair of shears are just as useful as a knife. With a certain knack in handling the shears the bark is not sufficiently bruised to injure the tree.

After the trees have started and sent out shoots several inches long it is time to take away the soil raised around the tree or cutting. It is not a good idea to cover the cutting with straw or manure, as it contains seeds which will germinate. It is hardly necessary to state that at no time should there be anything growing within 4 feet of the young plant. A space of 6 feet is preferable on each side of the tree.

The number of times the fig should be irrigated varies according to locality and season. The only guide is to observe the terminal bud. If this bud shows a stoppage in growth it is a sign that the tree needs water. After September no more growth is desirable. After heavy irrigations the land should be cultivated, and in no instance should it be allowed to bake around the tree. The weeds in the orchard are kept down either with two-horse cultivators or with underground cut drags. The latter consist simply of a drag or cultivator, furnished with a long horizontal knife several inches wide. This knife runs a few inches below the soil surface and cuts the roots of all weeds in the most effective manner.

As a rule no pruning is required during the first year or two; the trees are allowed to branch from the very ground. Trees that are raised to a standard of 3 or 4 feet, as is generally the rule, even in the best orchards, are always at a disadvantage. The branches should be low and the trees should be as shady as possible.

After the first year the plowing and cultivation goes on very much as during the first year. The first plowing is done when the weeds in the orchard have attained some little size. This is generally in January. At that time the orchard is plowed in such a manner that the soil is thrown from the trees toward the center of the land. Later on one, two, or three cultivations, with two or four horse teams, are made crosswise and lengthwise to the first plowing. By the end of the season the land will generally be found to be quite level. Next year the first plowing is made crosswise to the plowing of the previous year, and so on. One plowing and three cultivations are generally sufficient each year. The plowing should be as deep as possible and not less than 6 or 8 inches, in order to prevent the formation of roots too near the surface. As regards irrigation the same rule holds good as the first year. The end buds must be watched and be kept growing until September, or until the crop is harvested. No pruning is required except keeping the trees in form, cutting dead wood and crossing branches, as has been described in its proper place.

The caprifig trees are the first which require the attention of the orchardist. In the second year they will bear some caprifigs, and these should then be caprificated. Caprifigs containing Blastophaga wasps should be procured from the nurseryman who supplied the trees or from some other grower. The first caprification is done in the spring (probably in the end of March, when the mamme figs from older trees are suspended in the caprifigs), provided they have no insectiferous mamme of their own. The insects soon hatch out and enter the caprifigs of the young trees. If from that time on there is such a succession of the three crops of the caprifigs that these crops overlap each other in a proper manner, no further caprification is necessary, as the blastophaga wasps will take care of themselves. But in case there is found to be a considerable lapse between the profichi and the mammoni—first and second crops—then a new caprification of the mammoni will be necessary, and, similarly, if there is a lapse between the mammoni and the mamme, then the latter—the third crop—requires to be caprificated with figs introduced from some other place. In order to have such a succession of crops of caprifigs it is desirable to plant many kinds of caprifigs, as has been already pointed out. It is highly desirable that the cultivator caprify his caprifig trees as soon as they begin to bear, in order to acquaint himself with the nature of the process of caprification. It may be possible that he will have to caprificate his caprifig trees every year as long as he cultivates Smyrna figs, and not only once a year, but several times a year; in fact, once for every crop. But this supposition is an extreme one. If he has a proper number of good varieties of caprifig trees, it is probable that the wasps will take care of themselves, and that there will always be figs ready to use in caprificating the Smyrna varieties.

When the Smyrna varieties come into bearing they are caprificated for the first time in June or July by the profichi or first crop of the caprifigs. The insectiferous figs are suspended among the branches of the Smyrna figs at an interval of ten days or two weeks. After this has been done no more caprification of the edible figs is necessary that year. A month or more later the figs begin to ripen, and then drop to the ground. The Smyrna figs are never picked from the trees, because when they are fully ripe they fall of their own accord. If they do not fall they are not fully ripe. The figs are picked up every day and placed on trays to dry in the sun. They are turned once or twice and then taken to the warehouse and sheds, where they are dipped and packed.

As regards fertilizing the soil, this practice is not yet in vogue in California fig orchards. Manuring the soil will of course be beneficial in the highest degree in places where the soil is poor. Powdered sheep manure, ground bone, stable manure, and artificial fertilizers will all be used in time. But before everything else lime is most to be recommended, as experience has shown that the best figs are grown on lime soil.

PERIOD OF VEGETATION.

The edible fig (*Ficus carica*) is a deciduous tree, which drops its leaves even in tropical countries where no frost exists. It never becomes an evergreen tree. In temperate climates, where moisture in the soil is overabundant, a very rank growth will be caused, especially with young trees under 4 or 5 years old. This growth, which continues until cool weather, is liable to get frosted, to the great detriment of the tree. But even if not checked by frost, this growth would soon stop by itself and the tree would become semidormant or almost dormant. There are, however, many wild-fig species which are evergreen, especially in the tropics. Others are semievergreen—that is, they preserve a few evergreen leaves at the top after the majority of the leaves have fallen. Other tropical species are doubly deciduous—that is, they drop their leaves twice a year, at the end of the rainy and at the end of the dry season, only to clothe themselves with new foliage after a rest of two to three weeks. The caprifig tree is a deciduous tree.

The fig tree begins to bear well at about the fourth year, but increases its yield rapidly until 12 to 14 years old. After that time the increase is slower, and after thirty or forty years no great increase can be expected. However, different varieties act differently, and there are off years when smaller crops are had. The variation in this respect relates rather to the first crop, or "brebas," than to the second crop, or autumn figs. Undoubtedly the climatic conditions are more changeable in the spring, and thus the change is greater in the early crops than in the later ones. The critical period of the first crop is the time of setting, while of the later crop it is the time of maturity.

CHAPTER VIII.

PRUNING FIGS.

GENERAL REMARKS.

The pruning of the fig tree must be regulated according to the age of the tree, as a young tree just planted must be pruned radically different from one which has been grown in the orchard a year or more. This remark refers only to the fig tree as grown in the semi-tropical regions and not to trees growing in more northern climates. The pruning of the latter will be remarked on under the headings of the districts where they grow. As a general rule the fig tree requires less pruning than does any other fruit tree grown in temperate climates, except possibly some species of nut trees. Neglected cutting back of recently planted trees may be the indirect cause of their dying, while a cutting back of old trees may cause them to be barren or to yield inferior crops for years. Still, a proper pruning for fig trees is necessary, both to young and old trees; but this pruning, although not less important, must be radically different from that accorded to other kinds of fruit. This refers especially to old bearing trees, as young fig trees may be pruned in almost any way without harm.

PRUNING LATELY PLANTED TREES.

All fig trees should be grown in such a manner that the foliage may be high enough above the ground to freely admit air and wind. Upon this depends not only the growth of the fig tree, but also the quality of the fig crop. Six feet to the lower limbs would be a good height to give a fig tree grown for fruit. This height may be given at once or gradually, and the first pruning should be done with the ultimate form in view. Many growers cut their fig trees back after planting to within a foot or so of the ground. This is a safe way, as the more the young trees are pruned back the surer they will grow. But this cutting back has at least one great disadvantage; it causes the side stems—the future standards—to come too close together, causing them to split off from the main trunk when in a few years they shall become sufficiently heavy. There are two ways to avoid this; one is to cut the tree at planting close to the ground and allow three different shoots to form the new standards. This is really the natural habit of the growth of the tree. All wild figs branch at the roots, and the different branches or standards in time grow together at the base, forming an enormously wide but very short trunk. Trees grown in this way are not apt to split. When fig trees are planted wide apart in the orchard, and for fruit alone, this several-standard system is considered a good one. It differs somewhat from the general custom, but it agrees perfectly with the nature of the tree. How this is best accomplished by planting two cuttings in one hole has been explained.

If a single standard from the soil is desired, the trees should if possible not be cut back at planting lower than 4 feet from the soil, or better yet, allowed to remain at 6 feet from the soil. Side branches should be encouraged at least 1 foot or more apart, in order that the crotches may not come close together. If the planted tree has several good side branches, cut back the top to the uppermost of these branches and cut out other branches, except those left for the main branches for the future head. All the smaller branches may be left to grow and the thinning out postponed to the next year, the object in leaving them being to enable the tree to shade itself as much as possible the first year. The side branches may be cut back if required, this cutting back doing no injury to the young tree. In after years, however, it can not be allowed, except under particular conditions—as, for instance, when it is desirable to balance an ill-shaped tree. This form is not suitable in the orchard.

PRUNING BEARING FIG TREES.

As has already been stated, most fig trees suffer if their branches are cut squarely back. In all old fig-growing countries, even in England, the saying is: "A fig tree cut back will give no good crop." This has also been the experience in California, especially with heavy-growing kinds. The writer has known an instance where large fig trees which were cut back for cuttings did not again bear good figs, and several similar instances have been reported where for ten years the trees did not recover their producing power. After the first year, therefore, the fig trees should only be thinned out. Never cut back the fruit-bearing branches in such a way that the same branch can send out side shoots below the cut. If cutting be necessary in order to shape the tree, cut back to the fork in such a way that the whole branch will be cut off, either to the main trunk of the tree or to a main branch, and let it be remembered that the less heavily the fig tree is pruned the better for the bearing quality of the tree and the better for the quality of the fruit.

When cut off squarely a branch sends out side branches from a number of eyes immediately below the cut and the end of the branch will look somewhat like a brush. These side branches will interfere with one another and with other branches of the tree, and most of them must be cut away the following season in order to shape the tree and to admit air, light, and heat. But if the branch in question be cut off further down close to a fork the remaining branch of the fork with its terminal bud will lead off the sap and the brush-like formation will not take place. In other words, after a fig tree has been necessarily pruned every branchlet as well as every branch should possess a terminal bud in order that the new branch system may consist of fairly parallel branches. With this point steadily in view the next consideration will be that of pruning bearing trees.

Unlike other fruit trees, the quality and size of the fig is not improved directly by heavy pruning, except in cases where fig trees are grown in pots or against walls. A fig tree with many branches will bear as large and as fine fruit as a fig tree with few branches. Indeed, it will as a rule bear larger and better fruit. The object in pruning is therefore generally not to increase the size and flavor of the fruit. Still, it can not be denied that the proper pruning of old and heavy growing fig trees will improve the quality of the fruit indirectly, though not exactly in the same way as in other fruits.

The fig must be pruned in order to admit light, heat, and air, and to prevent crowding and bad shape and the interference with other crops grown among the trees. If the fig crop is the principal one the latter consideration must be secondary only.

Heavy-growing fig trees, such as Adriatics, etc., produce better and larger figs if pruned; but this pruning must consist in simply cutting off the young year's wood whenever several branches start out too close together from the same limb. Thus in the above variety the young bearing wood should be at least 2 feet long, without side branches. All other twigs may be cut off close to the main branch, but never cut off squarely or simply cut back. Only cut them off close to the mother branch, as the latter will then bear better and larger figs.

The pruning of the fig when grown in the open should be confined to three or four distinct points. The sterile twigs generally found at the base of the main branches should be cut off each year. These twigs are generally bent downward, are slender, and seldom bear fruit. Larger as well as smaller branches which cross one another should be so cut out that no further interference is possible. The center of the tree in thick-growing varieties should be thinned out or cut entirely away in order to admit sun, air, and light. Lower branches too close to the ground should also be cut off close to the main stem or main branches; and finally, if a tree is unevenly balanced the branches on the larger side may be cut back in order to properly balance the tree. But in all these operations all cuts should be made to a fork and the cut branch should never be without a leader. And finally, in any heavy growing and bearing varieties the side branches of the yearling wood may be cut off close to the stem. As to the time of pruning, the best time is when the leaves have fallen and the fig tree is most dormant. Some sap will always flow, but the more dormant the tree the better.

HIGH AND LOW STANDARD.

The final question, whether high or low standards should be given to fig trees, must be entirely dependent upon climatic conditions and other circumstances. In moist ground the figs should have a high standard, in order to admit the necessary air and light, especially so in localities where the souring of the figs is a common evil. On the contrary, in places where moisture is scarce and where the figs may suffer from drought, the low standard should be adopted, with side branches sloping closer to the ground and shading the soil. Consideration should also be had for the variety, and as a general rule it may be said that figs for drying require higher standards than those grown for table only. The high standard may be considered at once when the trees are first set out, as has been already remarked, but a change from low to high standard may be readily accomplished later and gradually, without any great difficulty or injury to the tree. In Smyrna the branches reach the ground within 3 or 4 feet, while from the main root three or more standards start out at sharp angles to the ground.

CHAPTER IX.

IRRIGATION IN FIG CULTURE.

In localities where the rainfall is less than 25 inches during the rainy season irrigation is necessary. The fig tree, unlike most other trees, does not immediately show when it begins to suffer for want of water; at least it does not show it like other deciduous trees by the wilting and drooping of its leaves. In case the grower does not know when to supply water, the figs will be small and dry and be otherwise inferior. As soon as the fig tree begins to suffer from want of sufficient moisture in the soil it stops its growth. The terminal points of the branches will then suddenly cease to send out new leaves, and instead will begin to mature a bud. If this occurs during the growing season it is a certain sign that the moisture has given out. In all localities where the figs can not keep on growing until the fruit matures irrigation must be resorted to. The right amount of irrigation, the time to give it, and the proper way to lead the water on the land must necessarily vary in different localities, and no rules applicable to all conditions can here be given.

It may, however, be stated that the more water that can be given at once the deeper it will sink and the more the natural moisture will be imitated. Frequent irrigation will create surface roots and tend to keep the deeper ground dry. Flooding is not recommended, except in winter, as the winds are liable to overturn the trees; besides, heavy watering in summer or growing time does not imitate the natural rainfall and those other conditions under which the fig tree develops its fruit to the best advantage and greatest perfection. So far as possible all irrigation should be in the winter, when the effect upon the trees will be that of heavy rains only, provided no more water be given than the tree requires. Stagnant water and irrigation ditches do not tend to improve the fruit of the fig, and localities where such water prevails are unsuited to all figs.

There are, however, a number of varieties which require moist ground in order to produce good fruit. This is the case especially with black varieties, which, with few exceptions, require more moisture than white figs. In the catalogue of figs at the end of this book the writer has noted the preference for moist or dry soil for all varieties as far as known.

CHAPTER X.

DISEASES AND INSECT ENEMIES OF THE FIG.

DROPPING OF THE FRUIT.

Two distinct causes may effect the dropping of the figs before they are ripe. The most common of these causes is unfavorable climatic conditions, either in general or in particular, for a certain variety. This climatic defect may consist in any condition that will temporarily check the flow of sap to the figs. Cold nights, cold winds, and light frosts are equally as effective in causing the dropping of the fruit as are excessive dryness and great heat. Want of moisture frequently causes the fruit to drop or to develop poorly and become tasteless, coarse, and unhealthy. In this case moderate irrigation may be the remedy. Many varieties will always drop if raised in an unsuitable climate. In such cases there is no other remedy than to experiment with other varieties which may be suited to the climate. As numerous varieties of figs are originated under the most different conditions of temperature and moisture, there are enough varieties to suit almost every locality which can be at all favorable for fig culture.

In old Roman times the dropping of the figs was a cause for great annoyance, and the practical Cato gave remedies for its prevention, advising thorough working of the ground. As he did not mention caprification, it is probable that the fig varieties he cultivated dropped their figs from climatic causes only.

Another cause for the dropping of the fruit is a peculiar construction of the flowers of the figs. The Smyrna figs, which require pollination in order to produce ripe fruit, will always drop their fruit if not pollinated. Other figs will, for the same cause, drop their second crop, while their "brebas," which contain differently constructed flowers, will mature. It is hardly necessary to add that the latter class may also drop from climatic causes, even when properly pollinated. To ascertain which of these causes effects the dropping an examination of the flowers is necessary. If the flowers are receptive and have been properly pollinated, climatic defects must cause their dropping. If no pollination has taken place, this fact would cause the dropping even under the most favorable circumstances. Common edible figs suffer much less in this respect, as they are influenced principally by climatic conditions, while Smyrna figs are affected by both causes. Strong-growing varieties drop their fruit as readily as weak-growing kinds. There is no variety which holds its own better than the weak-growing Brunswick.

SUNBURN.

One of the commonest causes of diseases in fig trees is sunburn. This happens, however, only with young trees lately planted and before the new leaves and branches are sufficiently developed to shade the trunk of the tree. The effect of sun scald appears first at the collar close to the ground, later higher up, when the whole side of the trunk facing southwest may be found cracked and with peeling bark. This gives access to borers, prevents the proper circulation of sap, and greatly injures the tree in many ways. Sunburnt trees never recover their vigor and will always remain stunted. Sunburn may be prevented in various ways. One, of course, is in pruning the trees low or even allowing them to shoot out directly from the collar below the ground. Such trees are never injured by heat and sun. But if a higher standard be desired some other means are necessary for keeping the trunk shaded and cool. A newspaper tied to the trunk with common cotton yarn is, according to the experience of the writer, the best and cheapest tree protector. The yarn will never cut the tree as heavier rope will and the paper will gradually fall off just at the time when the leaves of the tree are large enough to shade the trunk. Medicated tree protectors should be experimented with before being generally used, as they sometimes contain chemicals strong enough to kill the trees, or at least to injure them more than sun and wind combined.

FROST.

Fig trees are easily frosted, especially when caught by the frost with their sap in full circulation, and while in full leaf.

In northern climates the old trees as well as the young trees are injured by frost, but in warmer regions like California it is the young trees only which occasionally suffer. Young trees may, through unfavorable conditions, be greatly injured by frosts in several successive years, but when at last successfully raised to the age of 4 or 5 years they will generally be hardy enough to withstand heavier frosts even than those which injured them while young. It is therefore unwise to say that such and such variety is not suited to any certain locality simply because it was for several years after planting cut back or down by frosts. This very variety, as has been repeatedly observed, may in the future be perfectly hardy and profitable. In San Joaquin Valley, California, for instance, the Adriatics were generally injured and even killed by frosts when they were first introduced. As the trees grew older no ill effects were visible after equally heavy frosts.

The injury done by frost shows itself in blackened and withering shoots which die back more or less. In severe cases the bark of the tree becomes black and rots, especially on the south side, where the sun strikes the frosted parts first and most. Smaller trees may be covered with mats or wrapped in straw permanently for the winter, while for continued cold the dwarf trees are even buried in the soil.

After the frost has caused damage to the branches there is no other remedy than to remove all injured parts at once and cut back until the flow of fresh milky sap indicates that healthy parts are reached. It might be necessary to cut back to the main trunk or even to cut the tree to the ground. If this be done in time new suckers will come up from which a new tree can be raised. If the tree is thus greatly injured it should be cut below the collar, the cut covered with grafting wax or pitch, and all the suckers allowed to grow the first year. The next winter these suckers should be covered by mats, straw, etc., in order to protect them. If they also are frosted there is very little hope for the tree. The following spring the strongest sucker is to be nursed into a tree, while the others should be cut and kept cut back severely through the season. The tree may even die to the ground or succumb entirely. The preventive measures are not many and not very effective. Young trees may be defoliated if they show no signs of becoming dormant at the time frost is most to be feared. Defoliation hastens the maturity of the wood, checks the flow of the sap, and renders the tree less liable to be greatly injured by frost. In France smoking is commonly used in northern fig orchards, the smoke being started an hour before sunrise and kept up for an hour after the sun is up. Tar, straw, and damp chips of wood are used to create smoke, which should be started on all sides of the orchard.

FUNGI.

In France the fig plantations suffer greatly from the attacks of a root fungus of the genus *Rhizoctonus*. The roots alone are infected and are destroyed in a very short time, the ultimate effect being to destroy the whole fig tree. This disease spreads rapidly through the orchard and operates before the cultivator is aware even of the presence of the disease. Sulphur has been used with small success. In order to prevent the wholesale destruction of the fig trees it is advisable to plant them alternately with other trees which are not attacked by the disease, such as olives, pomegranates, or grape vines, or to plant the trees so far apart that the roots can not interlace. Intermediate crops are then necessary. Any other remedy than isolation has never been discovered for this fungoid disease.

SOURING OF THE FIGS.

The souring of the figs is directly caused by a fungoid ferment, undoubtedly related to the fungus which causes acute fermentation in other sweet substances, such as wine. A more distinct cause of souring is the want of proper sweetness in the figs, too much water in the soil, or unsuitable soil. Figs which grow in moderately moist ground sour less than those that grow in wet soils. The drier the soil, to a certain point, the sweeter the figs. Very sweet, sirupy figs seldom sour, and certain varieties sour more readily than others under almost any conditions. To counteract this tendency to souring, the soil should be kept dry, though excessive dryness will also injure the figs. How increased moisture may gradually ruin a fig orchard has been observed several times. The writer once knew of several acres of fig trees which bore excellent and very sweet figs, the variety being the Marseillaise. These few acres were very profitable to the owner, but gradually the vicinity was settled; the soil became more saturated, because of extra irrigation introduced by new settlers, and as the trees grew older their roots struck deeper and more quickly through this added moisture. These figs gradually showed the effect of too much moisture, they became less sweet year after year, and more figs became sour. After the lapse of three years from the time they were in the height of profitable bearing the trees did not pay, and finally all were cut down as useless, except one or two around the house, which even there had become a nuisance on account of the dropping figs, which at last become sour, with only seldom a good or fair one.

Small flies are often seen emerging from sour figs. These flies are, however, not the cause of the souring. They are simply vinegar flies, which, attracted by the sour juices, flock to the fig to there lay their eggs and breed. They never visit healthy figs. The souring of the figs is greatly facilitated by their bursting open. As is well known in our fig districts, many figs burst open in the fall of the year or at the end of the summer. A few days after bursting the figs turn sour and become worthless for drying. The bursting open gives access to the interior of the fig to acetic bacteria, which cause the acid fermentation. As long as the eye was closed bacteria and fungi were kept out, and no fermentation could take place. There is no doubt that the principal function of the eye of the fig is to keep out bacteria and insects, and the closed form of the fig receptacle is undoubtedly effected by nature in order to prevent parasites from spoiling the sugary juice of the fig. Adriatics are especially apt to sour, but so far I have never found a sour fig which had not previously become cracked or split. The cracking open of the figs is due principally to moisture in soil and air. Figs will remain healthy on the trees until the advent of a rain storm or a fog. This increases the moisture in the air, which, again, causes the figs to swell from absorption of moisture. It is this swelling up which causes the figs to burst. Too much irrigation may have the same effect. Against the bursting on account of moisture in the air there is, so far as I can see, no remedy.

SCALE.

The fig tree in California has so far been very free from scale insects. In Europe, however, as well as in the Southern States, the fig trees are frequently attacked by scale. In the Mediterranean region the scale of the fig is the *Chermes caricæ*. It was mentioned by Cestoni in 1733, and has been common since that time. It is a large scale, one-third of an inch long by one-quarter of an inch wide when full grown, oval, convex, and of an ashy-brown color. The young hatch in May, and spread at once over stems, leaves, and even over the fruit. The effect is the stunted growth of the branches, dark spots on leaves and branches, the figs fall off, and in extreme cases the branches, and later the whole tree, succumbs. At the end of August the young scales gather on the outside of leaves and branches, and become stationary, where they continue to grow until the following spring, when the young burst the cover of the old scale and proceed as indicated. Probably any one of the scale remedies in common use may be successfully employed as an antidote, but the writer especially recommends the lime, salt, and sulphur compound, the composition of which is as follows:

150 pounds of sulphur.
250 pounds of lime.
100 pounds of salt.
25 gallons of water.

Use a kettle 2½ feet high by 3 feet wide. Put the water first in the kettle and boil the ingredients for eight hours, adding water as necessary. After boiling the prescribed time a mush-like mess is formed, which when put into molds hardens, but dissolves readily in water. Dissolve 5 pounds of this cake in hot water and then add 30 gallons of water. This is used as a spray on the trees in the spring before the scale hatches.

If this scale appears in this country it will probably be fought by the introduction of parasites.

BEETLES.

Small Coleopterous insects or beetles attack the figs in the vicinity of Paris. These insects of two species bore the figs while they are yet rudimentary, and cause great damage to the crop. As a remedy damp moss is placed in the vicinity of the stems of the fig. The beetles collect under the moss and may be removed early every morning. Another remedy consists in sifting ashes over the branches in the early morning while the dew is yet on.

WORMS IN DRIED FIGS.

The small maggots so frequently found in dried figs are not really worms, but larvæ of a small moth. These larvæ feed on the dry figs, as well as on other dry fruits. The eggs of the moth are laid on the fruit after it has dried and the maggots develop in a few weeks. Dipping in hot or boiling water is useful as a remedy; close packing and pressing of the figs will also to some extent prevent the havoc of the moth. A light sulphuring of the figs for a few minutes will probably kill the larvæ. The sulphuring is effected by burning sulphur in a closed chamber or room in which the infected figs have been previously placed. Too long sulphuring would undoubtedly injure the taste of the figs.

CHAPTER XI.

DRYING AND CURING FIGS.

GENERAL REMARKS.

The process of curing figs must necessarily be different in different countries, not only directly on account of climate, but because the figs are of different qualities, large or small, very sweet or watery, thin-skinned or tough, of good drying quality or the opposite. What will be set forth here is the method which has been the most successful in California—successful not because these methods are better than those employed in Smyrna or Portugal, the homes of the best dried figs, but because so far our figs are decidedly different from those grown there. The reasons for this are several. In this country we have tried extensively only a few varieties of figs out of a possible hundred or more. Many more varieties have of late been planted, but the time has been too short to decide which ones have come to stay. The fig territory of the Pacific coast is so large and conditions so different in different localities that at least ten or twenty years must lapse before it will be possible to assign the proper variety to the locality best suited to it. A great obstacle in the way of extended fig culture is the tendency of the growers to despise small or medium-sized figs in their endeavor to imitate the product of Smyrna. It is the medium-sized figs which are the successful ones in all the Mediterranean countries, except in the valley of the Meander. Neither Italy, Spain, France, nor Greece produces large figs for drying, but only small or medium-sized ones. Our fig growers should concentrate their first efforts in producing a merchantable and sweet fig for common use for the middle classes; then large, sweet, and showy figs, consumed in limited quantities by the more wealthy people, will be the necessary outcome. Not every place in our fig districts will be suitable for growing the large varieties, but a thousand places will be found where the medium-sized figs may be grown and cured with profit. The difference in curing different varieties is considerable, but not great. The size does not count as much in this difference as do the inert qualities of the fig—its sweetness and the facility with which it dries. It makes a vast difference whether the figs are picked from the trees or from the ground in perfect condition; whether they have to be sulphured before drying in order to prevent fermentation and to secure better color, or whether they can be dried as soon as gathered.

SIGNS OF MATURITY.

No figs should be picked before perfect and absolute maturity is attained, if the object is to produce a good dried fig. Figs picked before maturity will dry, but they will not be sweet and soft, the two indispensable qualities of a dried fig. It is therefore important that everyone should know when to pick his figs. Not all figs ripen at the same time; in fact, this successive ripening is considerable of an annoyance to the growers, as it necessitates the going over of the orchard several times. During the height of the season every tree must be looked over daily, or if the grower is fortunate enough to possess a variety which drops of itself when perfectly mature, these fallen figs must be picked up every day, because they spoil if exposed more than twenty-four hours on the bare and shaded ground.

A perfectly ripe fig will not only be soft, but wrinkled, and hang down perpendicularly from its branch or twig. Many varieties show additional little white seams or cracks, which always indicate perfect maturity. These seams are especially noticeable around the peduncle or stalk end, but not all varieties show them. The above general signs are common to all figs, and figs suitable for drying should also be sweet or very sweet.

The best Italian and Smyrna figs when dried show 60 per cent of sugar, equal to about 35 per cent before drying. Unlike grapes, figs will not become much sweeter after they have matured. The sugar will be more concentrated, but the quantity will not materially increase. A sign of great excellence in figs is when a drop of very thick sirup is seen hanging from the eye. The fig is then in its prime and can not be improved by hanging any longer. Figs hanging any longer on the trees are exposed to various ferments, acid or otherwise, which as soon as they set in will ruin them. Genuine Smyrna figs when perfectly ripe drop to the ground. They should never be cut from the tree.

OILING THE FIG.

This operation consists in piercing the eye of the fig with a needle dipped in oil or by closing the eye of the fig with a drop of olive oil. This process is of very ancient origin, and must not be confounded with caprification. While the object of caprification is to cause the fruit to set and produce fertile seed, the object of the oiling is to hasten the maturity of the fruit several days. For the practical part of this oiling see article on "France." The physiological effect of the oiling is not explained, and is probably to be found in something else than in the mere exclusion of air.

The origin of the practice is very old. In the Old Testament the prophet Amos (chap. VII, v. 14) speaks of "bôlēs schiqmîm," which was translated by Luther as "Who take off the mulberries." But the true translation according to Solms-Laubach is "Who performs an operation on the fig." Bôlēs or balas, however, refers to wild figs. It has been suggested that the expression of Amos refers to caprification, and was so given by De Lagarde. But it is much more probable that "bôlēs schiqmîm" refers to the process practiced to this day of cutting or piercing the sycamore fig with a knife, in order to cause the Blastophagas to develop quickly and leave the fig.

In Italy the oiling of the fig is called "egliazione." The process was mentioned by Theophrastus as practiced by the ancient Greeks, and Pliny mentions it as one of the practices of the Romans. In modern times oiling is in vogue in Italy, Syria, Spain, and Provence. Even other substances have been or are used, such as alcohol, and (according to Professor Solms-Laubach) Dr. Eisig was told in Ischia that oil caused "muso chiuso" (mouth shut), but alcohol "muso aperto" (mouth open), indicating that oil would cause the mouth or eye of the fig to close, while alcohol would cause it to open.

It may be interesting to note that unless the sycamore figs are pierced by the knife they are said not to reach perfection nor to be edible. There is reason to believe that there is a twofold object in piercing the sycamore figs: first, to cause the wasps (*Sycophaga sycomori*) to quickly develop and leave; second, to cause the fruit to develop or to hasten its development. If such be the case, the piercing of this fig is at least partly analogous to the puncturing of the edible figs as practiced in Provence.

Oiling and puncturing of second-crop San Pedros will not cause them to develop. The writer has tried it several times without success. According to reliable testimony of French growers the oiling hastens the development and maturity of the figs about six days. It is generally practiced at Argenteuil, near Paris, where the production of "figues fleurs," or first-crop figs, for the Paris market is an extensive industry.

HOW TO ASCERTAIN THE SUGAR PERCENTAGE OR DEGREE IN FIGS.

Figs contain much less water than grapes, and while the latter require only to be squeezed out in order to have their saccharine measured, figs can not be thus treated. There are several ways by which the percentage of sugar may be ascertained, but the simplest one for the fruit grower is as follows: Procure a graduated glass from some firm dealing in chemical apparatus. The graduate should not hold less than a quart. Fill this to the upper graduation with figs, not packed, but loosely shaken in. Then pour on water slowly until this also reaches the top graduation. Then take out all the figs one by one, place in a dish to drain, and add this drained-off water to what is left in the graduate and ascertain to what line this water reaches. The difference between this line and the top line indicates the volume of the figs. Suppose that this is 20 per cent. Next cut the figs into smaller pieces, place in a clean pot, cover well with water, and heat to the boiling point. At least 40 units of water should be added to the figs if their volume was 20 per cent. After having boiled for a while ascertain, by tasting, if all the sugar is leached out of the figs. If so, remove from the fire. Filter the liquid from the figs and then squeeze the figs in a cloth until as much of the liquid is removed as possible; then add this liquid to the former liquid. If this liquid in which the figs have been boiled measures less than 20 units, more water must be added; but if it measures more than 20 units, or the volume of the figs, it must be evaporated by boiling until it shows exactly 20 per cent. Filter through blotting paper and then weigh with a saccharometer. In order to have first-class dried figs the saccharometer should indicate 35 per cent of sugar. The object of the whole process is to extract the sugar from the figs and to ascertain correctly its percentage in relation to the volume of the figs. This method will only suffice for a rough estimate and not for a chemical analysis. As the commercial value of figs depends principally on the quantity of saccharine they contain, every grower and dealer should be prepared to test the saccharine. Fresh figs used for drying should show not less than 35 per cent, and dried figs not less than 55 per cent of sugar.

GATHERING THE FRUIT.

Figs destined for drying should be carefully handled in order to preserve a fine appearance when offered for sale and also to prevent undue fermentation while curing. In localities where caprification is practiced, little labor is required in picking the figs, because caprificated figs, or varieties which require caprification, fall from the trees when perfectly mature and in prime condition for being dried and cured. The cause of this dropping must be sought for in the perfect condition of seeds and consequent perfection of the fruit, the nature of which is to fall from the tree when sufficiently developed to propagate its kind. Figs which have not been caprificated fall first from the tree when decay has begun to set in in some form or other. Such figs are therefore never as perfect as when cut from the tree at the proper time. If carelessly pulled from the branches the figs will be bruised and torn, the skin around the neck is apt to be injured, and quite frequently the neck itself is torn off, exposing the pulp of the fig to view. Bruised figs will be inferior in many ways. The contents will ooze out, and pulling and fancy packing can not be resorted to. Figs may be twisted from the branch by an expert picker, but even with the best of skill and care many figs will be injured. Besides, the process is too slow. The proper way is to cut the figs from the branch as closely to the tree as possible, leaving no part of the neck and stalk adhering to the branch. A small knife with a fixed blade, such as is used for picking grapes, may be used, but a size smaller is more convenient. A knife 6 inches in length—handle and blade—is of proper size. The knife should be quite sharp, or it will tear the delicate skin of the fig.

For gathering the higher figs a convenient instrument may be made, called the "fig picker." It consists of a forked stick or artificial fork, across which has been tacked a strip of tin plate. Below this is a bag kept open by a wire. (See elsewhere for further description.) With this fig picker the highest figs may be cut without being bruised, but the process is slower than cutting with a knife and should be used only for figs which otherwise could not be reached.

SULPHURING.

Sulphuring is a process by which fresh fruit, immediately before drying, is exposed to the fumes of burning sulphur in a closed chamber called the "sulphur box." The object of sulphuring fruit of any kind, and especially figs, is twofold: First, to prevent fermentation during the process of curing; second, to bleach the fruit. The action of the sulphur fumes is deathly to the microorganisms or fungi which, as is well known, cause the fermentation of various substances containing sugar. The action is also purely chemical, as sulphured fruit assumes a semitransparent and light-yellowish color, the more intense the longer exposed to the fumes. Sulphured figs, as well as sulphured fruit generally, is inferior to fruit which is naturally of light color and unsulphured. Not only is the acid caused by sulphuring easily tasted by anyone with a sensitive taste, but the effect of the acid is purgative, and the use of sulphured fruit for any length of time is injurious, especially if the fruit has been exposed too long to the fumes. The writer is not an advocate of sulphuring generally, and does not advise the sulphuring of figs unless it be found that otherwise they will not dry properly nor assume the light color demanded by the market or the trade. Many fig varieties do not dry well, but ferment, puff up, and become acetic during the process of drying, even when exposed fully to the sun. If sulphured, however, for a few minutes, the germs of the ferment are killed and the curing will proceed without difficulty. This is especially the case with large figs of inferior sweetness. Figs which require no sulphuring are greatly to be preferred to those which do. The true interest of the fig grower is to procure varieties which will dry readily and assume a good, pale, semitransparent color without any chemical manipulation.

Sulphuring, when necessary, should be resorted to as soon as the figs are picked and placed on the trays. The sulphur box is closed and made as air-tight as possible. It should not be over 5 feet high, but wide enough to admit two trays. The trays are placed two deep in the box, and are made to slide on a rack or on cleats nailed to the sides. The door must be made to shut very tight, or the fumes of sulphur will escape. There should be at least 2 feet between the place where the sulphur fumes are originated and the lowest tray. This tray should be dampened, but not contain any figs. The figs are placed on the trays as close as possible, but only one fig deep, and with the eyes pointing in the same direction. Fill the box with loaded trays, light the sulphur, and then close the door.

The late B. M. Lelong suggested the following method of creating the sulphur fumes: Place a small kerosene stove on the floor of the sulphur house, and on the stove a heavy sheet of iron 1½ inches thick. Light the stove, and when the iron is hot, but not red-hot, extinguish the light and throw the sulphur on the plate. The fumes rapidly fill the house, enter the figs, and kill the ferment, and also act on the skin of the figs. The amount of sulphur to be used varies, but a couple of handfuls are sufficient if the box be tight and the figs not too watery. It takes about five minutes to fill the house with sulphur fumes and six or seven minutes more are required to sulphur the figs. If exposed too long their taste will become too acid and the skin will peel off when the figs are handled. It is preferable to have a little darker color than to have the figs sour. All sulphuring should be done in the morning or before noon. The sulphured figs should be exposed to dry air and sunshine in order to get a good color and as clear a taste as possible. It is unfortunate that the market accepts sulphured figs and that it requires the figs to be excessively light colored.

Some growers sulphur their figs for six hours, and some even leave the trays in the sulphuring box over night. It is deplorable that the market is such as to command the sale of such fruit, which, to the writer at least, is unpalatable in the extreme.

Genuine Smyrna figs never require sulphuring.

It is hardly necessary to add that only light-colored figs should be sulphured. Black figs if sulphured assume a very disagreeable color.

A gentleman who was born in the Smyrna district furnished the writer with the following method of sulphuring, though it is not thought that he practiced the method while there. He recommended one-half sulphur and one-half saltpeter mixed, the fresh figs to be exposed to the fumes of this mixture for fifteen to twenty minutes, then for three days, and afterwards sweated for several weeks. The writer has not seen figs treated thus.

DIPPING WHILE FRESH.

Instead of sulphuring, some growers dip the figs while fresh in boiling water. Common salt water is best, but in lack of it 1½ pounds of salt to 50 gallons of water will answer. First rinse the fresh figs in fresh water, then dip the baskets or buckets in which the figs are placed in the boiling salt water for one second or more, and repeat once or twice. This will soften their skins.

For dipping, Mr. A. Gartenlaub proceeds as follows: First wash the figs in pure water, then dip in a solution of 1½ pounds of saltpeter to 50 gallons of water, the water to be boiling hot. Dip once or twice. This method he claims to be better than the use of salt. The writer has neither seen nor practiced this method.

DRYING ON TRAYS.

The California and Arizona method of drying fruit on trays is by far the most practical as well as the most labor-saving way to handle the fruit during the process of curing. For figs the small trays used for drying raisins are the best, as they are a convenient size and easily handled. In order to save labor in carrying, the drying ground should be outside the orchard and adjoining the sulphur house. No drying can be done in the orchard, as the trees will shade the trays at least during part of the day. The figs require all the sun they can get. The drying ground should be as free from dust as possible. As the figs require repeated turning over while drying, it is most convenient to have the trays elevated above the ground sufficiently to enable the work of turning to be carried on without stooping down. The simplest contrivance is to provide "sawhorses," across which are laid long strips of lumber, 2 by 4 and 2 by 3 inches wide, and as long as convenient. The sawhorses should be 4 feet long, which will admit of two tiers of trays being put across. A man can then easily reach across from either side. The figs are placed on the trays, with the eyes all toward one of the long sides of the trays, and this side should be slightly raised in order to prevent the contents of the figs from running out by gravity. The raising of one side of the trays is easiest accomplished by placing the 2 by 4 strips in the center on the horses, and the 2 by 3 outside. This raises the trays 1 inch, which is generally sufficient for medium sized and not too pulpy figs. By placing an inch board above the scantling, the trays may of course be elevated 1 inch more.

Immediately after sulphuring—whenever sulphuring is absolutely necessary—the trays should be distributed on the racks and exposed to the full rays of the sun. This should be finished before noon every day if it is of importance to have a good color on the figs. Dark figs may be exposed any time of the day, as they are generally more easily handled than the white ones.

TURNING.

In order that the figs may dry evenly, they should at first be turned twice a day, and later once a day. Sulphured figs should be turned twice the first day, because if left overnight without being turned the color will be injured. Black figs need to be turned only once a day if not watery. The turning requires much labor, as it can be done only by hand and by turning each fig separately. No contrivance has as yet been invented by which all the figs may be turned at once, in the same manner as raisins are turned. By placing one tray on top of the other and turning the two together, the figs will become badly disarranged and will require more labor to be straightened than if turned at once by hand separately. Despite sulphuring and careful selection in picking from the trees, some figs will sour during the process of drying, especially if the figs are not very sweet. In turning, all such figs should be removed and used for vinegar or be thrown away. No pulling or pressing of the figs while turning is necessary, and no one can afford to put too much labor on them. The pulling and flattening is done after dipping and at packing.

The sour or fermenting figs may be easily recognized by their puffed up appearance and by the fermenting froth issuing from the eye. While turning, each fig may be given a slight pressure to ascertain its condition. If fermenting or sour, a wheezing sound is heard or "felt," the fig being watery and frothy in the center. Such sour figs will spoil the value of the box, being disagreeable and nauseous to the taste.

COVERING.

Figs, more than almost any other fruit, are susceptible of being injured by dampness, either in the form of rain or dew. Not only does dampness retard the drying of figs, but it spoils their color, or may even cause them to mold and rot. Rain is especially damaging both to figs on the trees and on the trays. It is therefore necessary to cover the figs not only when rain and fog are threatening, but every evening, as a protection against dew. If rain is expected it is best to stack the trays, placing one tray on top of another in stacks about 5 feet high. Four empty trays are placed on the ground, leaning against the stack, in order to keep off splashes of rain and sand, and the whole stack is then covered with a strip of canvas. In places where the fig industry is permanent, money and labor will be saved in having permanent drying beds made of brick and cement or filled with gravel. As such beds have appliances for quickly running the canvas over the trays, no stacking is necessary. Early at sunrise, or, better yet, half an hour afterwards, the covering should be removed.

WHEN SUFFICIENTLY DRIED.

It is of great importance that the figs should be exposed long enough to become sufficiently dried, but not so long as to be overdried. A fig when sufficiently dried and ready to be removed from the tray should, when slightly pressed between the fingers, be soft and pliable. The contents should be distinctly pulpy, and when pressed should not resume their former position, but remain as pressed. In other words, the pulp or meat should be plastic (not elastic), hard, and dry. If not sufficiently dried the fig will burst at the stalk end if pressed even moderately hard.

Underdried figs will spoil, sour, and mold, and will become useless. Overdried figs will be hard and leathery and tough; will lose their flavor and color, the white ones becoming darker and the black ones turning a dirty brown. The overdried figs may be partly improved by dipping, but the underdried figs can in no way be improved. In order to produce only figs which are properly dried and cured, it will be found absolutely necessary to remove daily all those figs which are properly dry, allowing the remainder to be exposed to sun and air a longer or shorter time. The time required for drying varies considerably between four and sixteen days, according to size, quality, and sweetness. To allow all the figs to remain on the trays until all are dry will produce a very inferior article. Daily removals are necessary.

SWEATING AND EQUALIZING.

It is less necessary for figs to undergo the sweating or equalizing process than it is for raisins. Still, figs are greatly benefited by being stored and equalized a few weeks before packing. But regardless of the desirability, which, however, is not a necessity, it is practical and labor-saving to house the figs a few days before packing. This is best done by placing them in sweat boxes of the same size as those used for raisins. In storing these boxes it is of importance to prevent fermentation. The boxes should never be placed close together, but at least 4 inches apart, and each tier of boxes should cover the one below in the same way as bricks in a wall; but there should be the space of 4 inches between the boxes. Between the rows of boxes a gangway of 3 feet is necessary, this being sufficient to allow easy access to the rows from each side. The boxes should be examined frequently by running the hand down among the figs, in order to ascertain if any heating is in progress. Heating figs must be at once removed and aired. If there appears to be any general danger that the figs may heat, it is preferable to pile the boxes in stacks, each box being placed crosswise on the one below. In this way the boxes are more readily removed, as they are not bound up in a whole tier of boxes. After a few days the figs will have become equalized as to their moisture, the skin will have softened considerably, and they will have otherwise improved.

DRYING FLOORS.

In places where many figs are to be dried, drying floors will prove a great convenience. Floors similar to those used for drying raisins, or slightly modified to suit the occasion, may be used for figs. On these floors the figs may be dried either by being placed directly on the floor or by placing the trays on the floor. The following directions may prove desirable:

The drying floors are built of brick and slightly elevated. The long sides are as long as required, but the short sides should be about 6 feet 6 inches, interior measure, allowing three trays depth. The back wall is 2 feet high and the front wall 6 inches high. At the bottom there should be a row of holes, to allow rain water to escape. The interior of this bed is filled with pebbles, if they can be had; if not, any gravel, if clean, will answer. Cement and asphaltum, however, are probably more desirable when their expense can be incurred. Along the back of the higher part of the floor should be a row of posts or uprights made of 2 by 4 inch lumber, driven securely in the soil. In the top of each upright is driven an eyelet, through which runs a stout wire the whole length of the frame. A strip of canvas is used for covering. The canvas must be hemmed and furnished with small rings, by means of which it is attached to the wire of the uprights. In front are similar rings, in order that the canvas may be securely stretched and fastened to small posts set in front, which, however, carry hooks instead of a running wire. In order to make the canvas waterproof it should be painted with at least two coats of linseed oil. Only pure linseed oil should be used, as impure oil cleared or mixed with certain chemicals will rapidly rot the canvas. If the floors are of the above size they will admit of three trays in depth. A pathway of 2 feet should be left between the rows of trays to allow the workmen to kneel while turning the figs. When the canvas cover is not in use it should be rolled up and fastened by straps to the back of the higher posts. In case of rain, and every evening, the canvas is easily unrolled and spread over the figs. Loose strips of lumber may be laid along the pathways to keep the canvas from pressing on the figs.

The above suggestions have been adopted and modified according to the plans of Spanish and Santa Ana raisin floors.

ARTIFICIAL DRYING.

In many districts it is impossible to dry figs in the open air, with the blaze of the sun as the only drier. In such localities evaporators or driers which produce artificial heat from fuel are required. The ideal dryer is not yet invented. There exists a great number of patented driers in the market, most of which are very good. Very large driers are expensive, and the writer prefers having a number of smaller ones, which are easier to manage and which cost less to keep in repair.

DIPPING.

Figs used for artificial drying are generally those grown in moist districts, where the seasons are less favorable to the full development of the fruit and where, consequently, the skin is thicker. Such figs should be dipped before being dried. This dipping is best done in a hot solution of potash or lye made from ashes of grapevine trimmings. The figs are first washed in cold water. This is done by placing them in perforated buckets holding 10 pounds and immersing the buckets in a trough of running water. Immediately afterwards the bucket is transferred to a kettle containing boiling lye, made of 1 pound of potash to 10 gallons of boiling water. The lye should be boiling and the figs suspended in it for 1 minute. No rinsing afterwards is required. The figs are spread on the trays in such a way that they do not touch one another, their eyes all toward the same side and slightly upward. The heat in the drier should never be allowed to run too high, as the best figs are produced by a lower heat of about 45° to 50° C., or about 120° F. The drying requires from thirty to forty hours, and when finished the figs must be pulpy and not rattling. They should be packed while yet warm, without other dipping or addition of sugar.

CHAPTER XII.

PACKING FIGS.

GENERAL REMARKS.

The packing of figs as practiced in different countries is extremely varied, and in each district figs are packed in many different ways, different grades being treated differently. The first grades in Smyrna are packed with extreme care, and no superior or equal packing exists anywhere. This skillful packing should be reserved for the best grades, and in imitating Smyrna we should first of all endeavor to produce quality in the fruit, and later quality in packing. It neither pays to pack inferior fruit in the best possible way, nor is it to advantage to neglect packing and place good fruit on the market in a slovenly way. For medium quality of figs a cheap but attractive packing should be adopted, reserving the greatest care and skill for the very best article. It is futile to believe that the consumer will repeatedly buy a poor article simply because it is packed to imitate the best foreign grade. The deception may succeed once or twice, but it will not create a lasting trade; on the contrary, it will bring the article into disrepute.

In packing, the grower should be guided by his own judgment and by the actual value of the figs. It is proper for him to procure the best imported article in the market, as long as the foreign figs are better than ours, and compare the homemade with the imported. Sweetness is the first important point in figs, and without it color and size do not amount to much. Therefore, if the figs are sweet—58 to 60 per cent of sugar when dried—consider the advisability of packing them extra well. If they are not up to the standard in sweetness it is better to adopt a less expensive method without neglecting taste in arrangement and attractiveness in appearance. A good article, even, will not sell if slovenly packed; or, if it sells, it commands an inferior price. Extra labor on packing good figs will be found very profitable. The Italian and Portuguese figs, though they may be really good, bring only inferior prices, and on account of general carelessness in packing and handling go mostly to the fermenting tanks and coffee mills. The Portuguese fig trade was not long ago superior to that of Smyrna, but neglectful packing ruined the business, or at least helped to ruin it.

There are two distinct modes of packing figs, regardless of the boxes or bags, mats, or drums they may be packed in. One way is to "pull" the figs and pack them in such a way that the eye of the fig rests in the center, it having been brought there by pulling and manipulating the fig. This we may call the "flat" way, and the figs are called "pulled figs." The other method is to pack the figs just as they grow and come from the tree. This may be called the "square" or "bag" way. In Smyrna the flat figs are called "eleme" (pulled) and the square figs are called "locoum," provided they are of the best grade.

DIPPING THE FIGS.

Whether the figs be packed in one way or the other, they should have previously been dipped. The dipping should be done immediately—that is, several hours—before packing. The dipping has a most pronounced effect on the figs, as it makes them soft, and in this respect affects both pulp and skin as well as improves the color. It equalizes the sugar in the figs and causes it to permeate to the skin. Even the poorest figs are improved by dipping, and many figs which, through careless handling, are not palatable will become so by dipping. The very best Smyrna figs are, however, not strictly dipped in the same way as the lower grades, but they are nevertheless moistened with salt water while being packed, and so important is this moistening that the figs could not be properly packed without being thus treated. The dipping should not be undertaken before the figs are thoroughly dried and cured, and only shortly before packing. If dipped and allowed to lie any length of time, the moisture will cause the color to darken. The air must be excluded from dipped figs as much as possible.

The process of dipping is as follows: Large and deep kettles are provided for keeping water constantly boiling either by steam or by direct fire, the size and number of kettles to be regulated according to the quantity of figs to be dipped. Alongside of the kettles should be a trough, with continuously running fresh water from a tank or ditch. Perforated buckets, holding about 5 gallons, are suitable for holding the figs while they are dipped. A long lever resting on a pivot, at one end furnished with a hook for holding the bucket of figs and at the other end heavy weights as a balance, makes a simple and practical contrivance. To every gallon of water in the kettles use about a quarter of a pound of salt. When sea water is to be had it is preferable. When salt is used the coarse common salt is better than the refined salt. The salt water can hardly be too salt; even a saturated solution would not injure the figs.

First fill the perforated bucket with figs, and by means of the lever rinse the figs by immersing them for a few seconds in the cold, fresh running water. Lift the bucket, and immediately after the greater quantity of water has drained off immerse it again in the boiling water for a few seconds. Then empty the figs on wire-screen frames placed a few inches above the floor and allow them to drain there for several hours. While draining, the figs should be covered with a cloth or otherwise be kept dark. Figs dipped in the morning should be packed the same day. Those dipped in the evening should be packed early the next morning. Black figs are less apt to be discolored than white ones. The very finest white figs need dipping only in cold salt water. The salt in the water should not be rinsed away, as it contributes to the flavor of the fig and brings out the sweetness. It also tends to keep the fig moist.

ASSORTING THE FIGS.

As has been indicated, the assorting or grading of the figs should begin when they are exposed for drying. The spoiled figs are removed daily. At least three grades and sizes should be made. All the good figs should be separated into at least two sizes, the poor ones of any size forming a third grade not suitable for packing. The size of the figs of each grade can not be stated, as it depends entirely on the variety of the figs, but in every variety of figs there are at least two sizes, and among Smyrna figs there are four or more sizes. All figs which are not sufficiently soft and of good color and attractive in appearance should be at once consigned to the basket for the lowest grades. Figs which, on account of being sour, show a peculiar softness in the center, and which when pressed causes the pulp to exude, should never be allowed to go in among good figs. Any buyer who chances on such a fig is certain to condemn the box and is not likely to invest again. Softness and color of skin, consistency of pulp, and size are the four points to be judged in assorting.

The best class of Smyrna figs weigh about 22 to 23 grams each; the average Italian and French figs weigh only 7 to 8 grams, or about two-thirds less.

PULLING.

As soon as dipped and drained, the figs should be "pulled" or worked preparatory to being packed. The "pulling" consists in squeezing and pressing the fig by hand, and is more or less complicated and expensive. This pulling greatly improves the appearance and the actual quality of the figs, making them soft and tender. While pulling the figs, the hands of the worker should always be moist with salt water. This prevents the sugar sticking to the hand, improves the figs, and makes the work easier. Figs may be either pulled "flat" or "square." Flat pulling is used for very large figs, making them appear larger than they are and causing them to present their best part to the buyer. The fig, held with the eye downward and the stalk inward by the thumb and forefinger of each hand, is gently and gradually pressed, and by repeatedly moving the forefinger on the under or eye side of the fig, the upper side is pushed outward and forward. At the same time the fig edges are flattened out and pulled circular. When finished, the fig forms a flat disk, the eye being exactly in the center on the under side and the stalk in the center on the upper or opposite side. In order to make the fig larger yet, the part just between the stalk and the periphery of the fig is split by the thumb nail, which of course causes the fig to spread out in front. This, however, should be done only in extra fancy packing, and really does not improve the fig, though such split figs pack more easily and appear larger. Figs pulled in this way present their finest surface on one side, the coarse and hard part around the eye being hidden. The skin around the stalk end is always the finest and handsomest part of the fig, presenting a semitransparent and beautifully streaked skin, contrasting greatly with the opaque zone around the eye. The only method by which this fine part may be properly presented to view is by the above-described "flat" pulling.

The "square" pulling may be either very simple or may require considerable experience and skill. The finest figs in Smyrna are the "locoum" figs, which are not flattened out, but which are worked into little cubes or bags, each fig being first squeezed in the hand. Then the sides are pushed slightly inward, the front being left blunt, the upper and under surface flat, but the stalk end is slightly pressed in and the stalk bent down. All this manipulation simply tends to give to the fig the form of a cube. A less expensive pulling is used for common grades. It simply consists of squeezing the figs repeatedly, both hands being separately occupied. The figs are not shaped, but only made soft.

PACKING.

The packing should be regulated according to the quality of the figs. The Smyrna way of packing the best figs in "bars" can hardly be improved. Each box contains three or more such bars, parallel to one another, and so well packed that each bar may be lifted out separately without disturbing the other two in the same box. What is accomplished with great skill and practice in Smyrna may be performed here by the aid of a small mechanical contrivance called the "guide." This guide consists of several parallel strips of tin of the exact length of the interior of the box and fastened to two other pieces of tin also parallel, but at right angles to the first one, and one at each end. These cross pieces are to be of the exact inside width of the fig box. The height of these four pieces constituting the guide is to be about one-half inch greater than the box. The use of this guide is easily understood. When placed in the empty fig box before packing it divides the box into three (or more if wanted) equal longitudinal compartments, each made to hold one bar, consisting of several or many layers of figs. The width of each compartment must be made to correspond to the width of each fig when prepared, ready to be packed. For different sizes of figs different guides are required, and of course different guides are also made for different sizes of boxes. The simplicity and convenience of this guide is evident. No matter what size of box and how many rows of bars are required to fill it, a guide may be made that will readily fit.

The process of packing "flat" figs is as follows: The guide is dropped in the box. A flat fig is then placed at the further end of the left compartment, with the "eye" face downward and the "stalk" end toward the packer. Another fig is placed partly on the top and partly behind this first fig in such a way that the front margin of the second fig just covers the center of the first fig, thus hiding the stalk. In this way the figs are thatched, or packed shingle fashion. The last fig in the row or bar must be partly folded upon itself, the stalk end being bent downward in order to fit the straight face of the box. If any one of the figs is a trifle too wide, the sides may be pushed together and made to fit the compartment. Care should be taken never to place too small a fig in a compartment. The next layer of the bar is packed in the same way, except that the box is turned around or the figs are otherwise packed so that their stalk ends point in the opposite direction from those in the first row; and so on, layer upon layer, until the compartment is full. If it is desirable that the box should be faced similarly on both sides, so as to present the same appearance if opened at either top or bottom, a slightly different method is required. In this case a guide is used which is about one-half as high as the box. A block or "follower" the size of the interior of the box, but only one-half as deep, is first slipped into the box, which should in this case be merely a frame, without bottom or top. On this follower is placed the guide, and the packing proceeds as previously described. When the last face is made the top cover is nailed on securely. The box is now turned over, the follower removed, the guide raised, and the other side packed the same as in the first instance. It is in some respects better to have only one guide, slightly higher than the box, and instead of one follower for the whole box, use one small follower for each compartment. The frame of the box is first placed on a loose drawboard, the guide is slipped down, then a follower in each compartment of the guide, after which the packing begins. After the cover is nailed on the box is turned over, the drawboard removed, each follower lifted out, and the box finished just like the other side. The followers should be covered with zinc, in order that they may be readily washed.

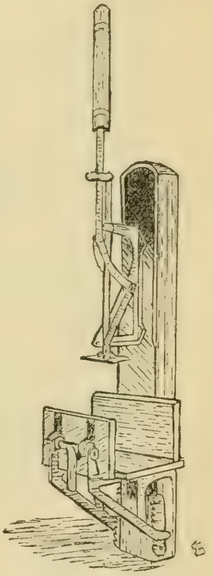


FIG. 30.—California dried-fruit press.

In packing square figs guides may be used or not. Guides may be made round or square or any shape required, their object being simply to keep the layers distinctly separate. For common packing, shallow guides may be made for simple "facing." Facing consists of placing rows of figs in a certain harmonious order at top and bottom of a box not otherwise packed with bars or rows. Even lower grades of figs which are simply dumped into the boxes may thus be faced to great advantage and with small cost.

PRESSING.

The final process in packing figs consists in more or less forcibly pressing the pack. This should be done with all figs except the best, which are so thin skinned, pulpy, and delicate that the weight of one box on top of the other, to the height of seven or eight, is sufficient to press the figs securely in the boxes. And even with these, the best figs, a moderate pressure by means of a press adapted to the purpose secures a quicker and more even work than the old Asiatic way of simply allowing the figs to press themselves. In order to secure this steady and regulated pressure there is no better machine made than the so-called "raisin" press (fig. 31). With this easily regulated lever press the slightest as well as the heaviest desirable pressure can be brought on the pack, according to the quality of the figs.

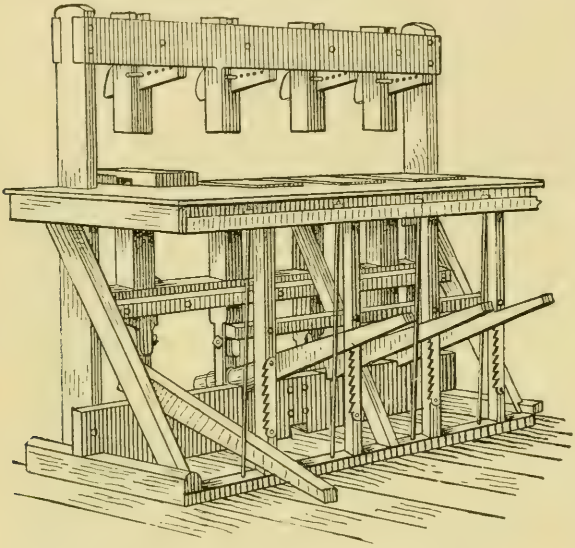


FIG. 31.—California raisin and fig press.

The final process is as follows: The guide being in the box, the bottom (or top) is nailed on. The pack reaches slightly above the box, even or almost even with the top of the guide. A follower is first put over each compartment of the guide and the box, placed in the press, is given a slight pressure. This has the effect of compressing each bar of figs separately. This first pressing should be heavy enough to bring the figs to a level with the top of the box. After the boxes have been left under the press levers for a few minutes they are removed and the guide is lifted from each box. This is readily done by placing the fingers on the followers and pressing them gently, while the other hand loosens the guide and finally lifts it out. The figs will have preserved the regularity with which they were packed and the line division between the bars kept straight and sharp and so perfect that a flat table knife may be drawn through the line without cutting the figs. This whole operation is quickly performed, and requires less time to be carried out than to be described. The pressing of other figs, packed with or without guides, in square, oblong, or round boxes, is accomplished in the same manner, easily modified to suit different requirements. In the case of round boxes round followers must of course be used.

If the pressure brought on the figs is very great the boxes may give and open while in the press. To avoid this there may be used a guard of galvanized iron of such size as to snugly fit the box on the outside, the height of the guard being, however, half an inch less than the box. The guard should not have a solid bottom, but one open in the center, a flange extending for half an inch along the sides being sufficient. This is done in order that the box may be pushed out if pressed too tightly into the guard. If the boxes are strong and well made, even this flange may be dispensed with, the guard then taking the form of a single band fitting outside the fig box.

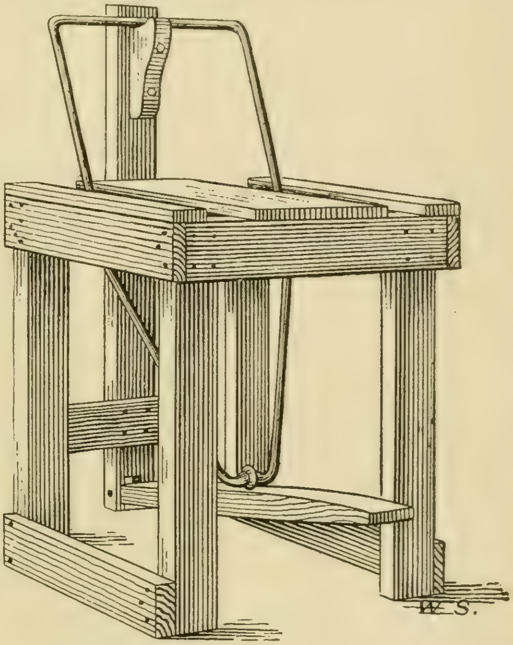


FIG. 32.—Green-fruit press in use in the United States.

After the guide has been lifted a final pressure may or may not be needed in order to allow the nailing on of the covers. The objects of pressing the figs are several. First, the necessity of having the pack solid, then to prevent evaporation and the drying out of the figs, etc. Smyrna figs are packed with pieces of sweet bay or laurel (*Laurus nobilis*) stuck here and there among the top layers. The aromatic smell of these leaves adds to the flavor of the figs and to the appearance of the box. The wild laurel (*Oreodaphne californica*), which is yet more aromatic and pungent, answers the purpose equally well.

In California the growers are now packing the figs in 5 and 10 pound boxes. Instead of bars the figs are packed in slightly oblong blocks of 1 pound each. Each such fig block is wrapped separately in paraffin paper, and in some instances tied with a colored ribbon. Five or ten such blocks are placed in one box. This packing, while now much in use, is not to be recommended, as it hides the figs and the buyer does not know what he gets. The idea of packing the figs in blocks of 1 pound each is, however, an excellent one for small figs, but the largest figs could hardly be accommodated to such small blocks.

CHAPTER XIII.

SHIPPING FRESH FIGS.

Fresh figs are hardly known outside of the districts where they are grown, though few fruits are more relished when once introduced. In the large centers of population in England and France fresh figs are counted among the indispensable luxuries, and many people are engaged in cultivating them for the market, either in hothouses or in the open air. Before rapid transportation became possible fresh figs could not be shipped any distance from the place where grown. Now figs may be sent 300 or 400 miles if properly packed. When the system of packing is better understood, and when special cars are devoted to transporting fresh figs, it will be possible to send them fresh and in good condition much greater distances without much risk or loss.

There are two points to be kept in view in sending fresh figs. The figs must be picked when fully ripe, but before they have begun to shrivel, and they must not touch one another in the box. The best time to pick the fruit is an hour or two after sunrise, when all the dew has dried away. Figs picked when a light dry wind is blowing will keep longer. Only perfect figs should be used, and as nearly as possible all should be of the same size, with no small figs mixed in. It will not pay to ship anything but the largest size of the best varieties. No uniform grade of boxes is possible, as each grade must depend upon the size of the figs and their shape and variety. The boxes should not weigh over 10 pounds, while 5-pound boxes would be even better. The ends should be of three-fourths, the bottom of one-half, and the sides and top of one-fourth inch boards. There should be an open crack between the pieces of the bottom and top, and the sides should have an open space of one-fourth of an inch at top and bottom. The boxes should be only deep enough to hold one layer of figs if the variety is tender, but if thick skinned it might hold two layers.

In order to keep the figs from crowding one another long strips of paper are used. Any stiff white or brown paper will do. These strips are as long as the box and about twice as wide as the fig. The strip is folded lengthwise before being placed in the box. When in position, half of the folded strip will rest on the bottom of the box, while the other half will stand up at right angles. In the angle between the two the figs are placed one by one in a single row, thus resting on the bottom part of the strip, while the upright part separates two rows. Fresh fig leaves may be used in the same way, but are not quite so handy, though if properly placed they give a tasteful appearance to the box.

Salicylic-acid paper and wax paper have also been recommended. The latter is less useful than the former, as it excludes the air. Salicylic paper aids in preserving the figs, and is cheap and practical. It may be used instead of common paper, or the common paper may be turned into salicylic paper by being sprinkled with a solution of salicylic acid in alcohol, in proportion of 1 pound of acid to 10 gallons of alcohol.

But figs may be successfully shipped long distances by simply being packed in boxes without paper or leaves, the number of layers always to depend on the quality of the fig; but it is safe to say that even the most thick-skinned figs should preferably be placed only two layers deep, while very delicate figs should be packed in one layer only.

CHAPTER XIV.

HOW TO DESCRIBE FIGS.

NAMES.

In noting the names of figs in the following catalogue the writer has adopted the plan of first using the name under which he has found the fig best and most correctly described, or the name given in the locality where the fig is principally cultivated. The first name is thus that under which the fig is best known. All the subsequent names printed in other type are synonyms or names for the same variety used elsewhere. The words within parentheses either indicate the locality where grown or the author of the description. If there be doubt as to which, a reference to the published list will clear the doubt. Names have not been translated except in a few instances where the cultivation of the fig in English-speaking countries warrants the use of an English name. Much harm and confusion have been caused by citations of only translated names, and if this custom, so often employed by theoretical writers, should be adopted, the final object of identification of all fig varieties suited to and valuable for cultivation would be lost. In some instances where the pronunciation of the foreign name is especially difficult to English readers, the translated name has been given preference, with the foreign name following in different type as synonym.

French or other names which begin with the article De la, etc., are arranged under their principal name. Thus the variety called De l'Archipel is found under Archipel, etc. As much as possible, such epithets as white, black, red, round, and long have been discarded, as they would too widely separate nearly related varieties in the catalogue. For instance, White and Long Verdal are placed under the heading of Verdal, Long, etc., thus enabling the reader to compare the description of the respective varieties more readily.

VALUE OF VARIETIES.

The list of names of figs and their descriptions are given for two distinct reasons. The first reason is that we may learn of the figs grown in foreign countries, where fig culture has been successfully carried on for two thousand years or more, while our own fig culture dates back only forty years. Many growers constantly cry out that fig culture is not a success in California and that figs do not do as well here as in the old countries. In answer to this, the writer begs to point to the long list of fig varieties known, which at least proves that a large number of varieties is required in order to insure this success in foreign countries, and, furthermore, clearly establishes the fact that a fig which is eminently successful in one locality is as glaringly a failure in another country not so very far away. How, then, can we judge as to the suitability of any locality to the culture of the fig, with hardly a dozen varieties generally distributed and grown to select from, and with the erroneous idea commonly accepted that this country already cultivates among that dozen all the best varieties of the Old World? Among the hundreds of varieties of value grown in the Mediterranean districts, some will no doubt be found to succeed in the Pacific States and prove valuable. But our true success will in time be based on our ability to originate new varieties suited to our conditions, which in many respects are very dissimilar to those of the fig countries of the Old World. This will not be done until the caprifig and the Blastophaga have been well established here, when accidental seedlings will pave the way for more scientific and intelligent efforts to produce what we so much require—varieties suited to localities where the figs are to be grown.

Another object of this catalogue is to enable our growers, to some extent at least, to identify such varieties as they now grow under fictitious or wrong names. For many of these varieties the writer has been unable to procure descriptions; others are only imperfectly known—a defect which it is hoped will be corrected in time.

DESCRIBING THE VARIETIES.

Even in the best horticultural books figs have had little attention and have been insufficiently described. This is especially apparent in French books on horticulture, which is the more strange, as France is the country where more care is bestowed on fig culture and fruit culture generally than anywhere else. All late French authors have copied descriptions given by the older ones, without critical research and comparison; the nurserymen in their turn have copied from one another, and no one has apparently even attempted to describe a fig so that it could be reasonably well recognized. The great number of varieties and their distribution in widely separate countries have made comparisons very difficult. In order to remedy this a type collection of figs has been established at Niles, Cal., where about 120 varieties are now growing and in bearing. Some seventy-odd and mostly new varieties have been added lately by courtesy of the Secretary of Agriculture. In properly describing a fig it is not sufficient to give size, shape, and color, as is so generally done, as there are scores of varieties in which these qualities are exactly similar, but which differ essentially in other points. A fig to be properly described must have all the following points mentioned and the same order of description must be followed, so that a comparison may be readily made with other varieties. The description should begin with the most apparent characteristics and end with those less readily seen. The following are the principal features of the fig, and in describing these even the experienced horticulturist would do well to use this list as a check list, taking up one character at a time in the same order of succession in which they follow one another here: Crop, size, shape, neck, stalk, ribs, eye, iris, skin, color, pulp, meat, growth of tree, branches, leaves, quality, soils.

If any one of these points is not touched upon the description must be considered defective, though it may still be possible to recognize the variety, provided it possesses some very predominant characteristic which readily distinguishes it from other figs. For students or horticulturists who examine many varieties a blank is recommended with the above headings, each on a separate line, ready to be filled out. In order that the descriptions may be fully understood it will be necessary to consider each heading separately.

Crop.—It is always necessary to mention first how many crops the fig tree matures, and then describe each crop separately if both are of importance. If in the following no particular crop is mentioned, the description always refers to the second crop. In copying descriptions of figs from Northern authors we can be almost certain that the first crop is referred to, provided the figs have been grown out of doors, and generally so even if cultivated under glass, as figs suitable for such purpose are generally, though not always, those which mature a first crop.

Size.—Roughly estimated, the size might be indicated as "small," "medium," or "large." I would consider all 1 inch or less in diameter as "small;" those between 1 and 2 inches as "medium," and those above 2 inches as "large." An average fig should be taken, one neither too large nor too small. The measurement should be made from the neck to the eye, or, to be more accurate, from the junction of the stalk and neck to the eye. For "width" the greatest diameter at right angles to the former should always be given, and in order to indicate the exact shape it is necessary to state whether the greatest width is at the center, below the center, or at the apex. To English readers the English inch is the most common measure, continental writers using the centimeter only. A scale of reference showing the relation between these two measures is appended (fig. 33).

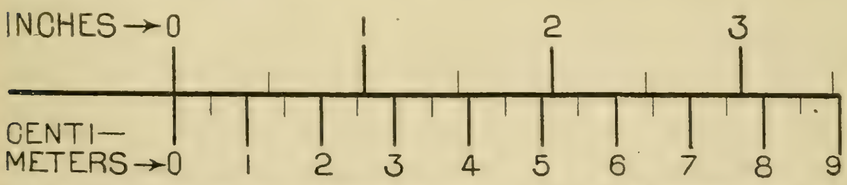


FIG. 33.—Diagram for comparison of inches and centimeters. (1 inch=2.54+ centimeters; 1 centimeter=0.39+ inch.)

Shape.—If the greatest width is at the center, the shape is called "ovoid" or "egg-shaped;" if between the center and the apex (or eye), the fig is "pear-shaped" or "turbinate," with rounded top; if at the apex, the fig is "bell-shaped," and if the apex or surface around the eye is flattened out, the fig may be called "obtuse," or flattened at apex like an onion. The shape of figs may be classified under two heads, round or oblong. "Round" figs are those in which both diameters are of the same length or in which the width is greater than the length from stalk to eye. "Oblong" or "turbinate" figs are all whose length is decidedly greater than the width. The length of the respective diameters enables the fig to be divided into two general classes, the characteristics of which are fairly constant. A better expression for a round fig would be globular, but as the word "round" has been generally adopted by other writers, no change has been made.

Neck.—The neck of the fig is the part situated nearest to the stalk. The neck may be "none" or "absent;" "no neck" if the fig is entirely globular; or it may be "short" if about one-fourth the long diameter of the fig; "medium" is above that, but not reaching one-half the length of the long diameter of the fig, and "long" if above half the length of the fig. The neck must not be confounded with the stalk, as is often done. The neck is part of the main body of the fig; the stalk is the part outside of the fig proper, which connects the fig with the branch on which it is suspended. The neck may be "well set" if it is considerably narrower than the body of the fig, or it may be "gradually tapering" to the stalk; or it may be "very thin," "slender," or "compressed sideways," all of these expressions being readily understood. (See fig. 34.)

Stalk.—The stalk connects the neck or body of the fig with the branch upon which it is suspended, and should never be considered in the measurement of the fig. It is of greatest importance to know the average length of the stalk, as it varies much with different varieties, being "short," "medium," "long," or "very long." The same expression is used in regard to the neck. The stalk may be "rounded," "flat," "three-cornered," etc., all points which should be noted in describing a fig. The length of the stalk varies to some extent in the same variety, and care must be taken to give a true average or to note any unusual variation in length, thickness, etc. It is also of importance to note whether the stalk breaks off readily from the branch or must be cut off when the fig is ripe. (See fig. 34.)

Ribs.—The ribs are longitudinal ridges running from stalk to eye. They may be confined to the neck, to the body of the fig, or may extend to the eye. They are higher or lower, or take the shape of mere lines, generally colored darker. They may branch, or higher ribs may alternate with lower ones, or they may partly dissolve themselves into warts. Some figs possess no trace of ribs; in others the ribs fade out or fuse at eye or neck. (See fig. 34.)

Eye.—The eye is the opening in the broad end or apex of the fig. It may be "closed" or "open," and there are various degrees of openness. The eye may be "sunk" if below the surface of the fig; it may be on a level with that surface, or it may be "protruding." In such cases it is generally surrounded by an elevated ridge, like a crater. The "iris" is a colored zone surrounding the scales of the eye, situated between them and the elevated ridge. It is not identical with the ridge itself. Some writers refer to the eye as the "mouth" of the fig or the "ostiolum." (See fig. 34.)

Scales.—The scales closing the eye are either "few" or "many," "broad" or "narrow," "colored" or "pale," "margined" or "uniform" in color. They are "flat," or they may stand out upright, or may even greatly protrude.

Skin.—The skin is "smooth," "warty," "rough," "hairy" or "downy," "glossy," "waxy," etc., all these expressions being readily understood. It may be dotted over with light specks or large spots. It may be "thick" or "thin," adhering to the meat or readily separated. The skin may also be "tough" or "tender," and finally it may crack at maturity in longitudinal or in transverse lines, deep enough to show the meat underneath. This cracking of the skin must, of course, not be confounded with the cracking or splitting open of the fig under unfavorable conditions.

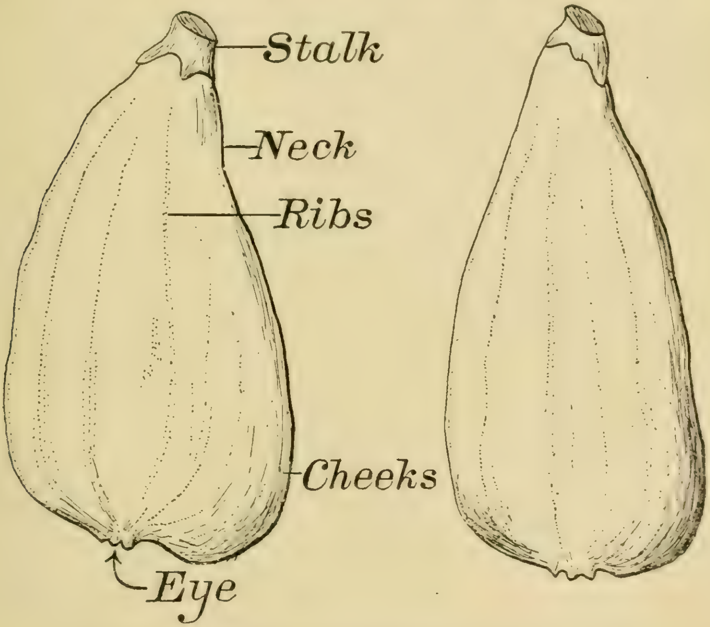


FIG. 34.—Brunswick fig. Illustrating the various parts of a fig.

Color.—The color should be given, separately, if necessary, both for neck, body, and apex, eye, iris, scales, for shaded side or for the side exposed to the sun. The fig varies considerably in color. For instance, the Adriatics grown in the vicinity of San Francisco Bay always retain a green or bluish-green color, while in the interior they often turn bright golden yellow, etc. This variation in color is the greatest obstacle to a proper description of the fig, and it is therefore of importance to always state where the description was made.

Pulp and meat.—The pulp is the inner soft part of the fig surrounding the seeds. Between the pulp and the skin is found the meat. While the pulp is often red, the meat is rarely so, though it is often streaked red or violet. The pulp may be "white," "yellow," "red," "purple," "opaline," "rose," "streaked," etc., and may be "coarse" or "fine." The pulp and the meat should never be confounded, but mentioned separately.

Seeds.—The seeds are either "large" or "small," "few" or "many"—relative terms, of course, but terms which may be used to great advantage. The size of the seeds of the imported Smyrna figs may be considered as a standard with which to compare others.

Growth.—The growth of the tree may be "strong" or "weak," "upright," with many or few branches, or with drooping branches, etc. The leaves are either "large" or "small," "entire" or "deeply lobed," "dark" or "light," "glossy" or "hairy," "regular" or "lopsided." The lobes are either 3, 5, or 9 in number, or the margin may be "entire." They may be "acute," "pointed," "rounded," "obtuse," "cuneate," "wavy," or "smooth." As the leaves vary on each tree, an average leaf adjoining a fig should always be taken as a model for description. Finally, it should be stated whether the stalk of the leaf is unusually "short" or "long," "dark" or "light."

CHAPTER XV.

CATALOGUE AND DESCRIPTION OF FIGS, INCLUDING SMYRNA FIGS AND CAPRIFIGS.

In the following catalogue the names of figs printed in black-face type are those which stand as distinct varieties. Those printed in italics are synonymous with others, and should be looked for under the respective names given immediately following. Where more than one name is known the most desirable name is that given at the beginning of the line, while the names in italics following are less-known ones. Names within parentheses indicate the locality where grown. For instance, Brayasque (Provence) indicates that the name is used in Provence, France. *Ficus sylvestris* var. *festinatissima*, Geny, indicates that Geny is the author who named the variety. The word "variety" is abbreviated to "var."

Most of the descriptions are based upon examination of figs grown in California, especially at Niles, where are found the United States Government collection and the private collection of Mr. John Rock. Some descriptions have been taken from foreign works on figs, but only in cases when the variety has not been seen by the author.

Abakour amellal.—A white fig, the name meaning early white; extensively grown in Kabylia. Two crops.

Abakour aberkan.—A black fig from Kabylia. Bears many and very good first-crop figs called "bakour." The word means early black.

Abelr'endjour.—A black fig from Kabylia which does not require caprification.

Aberzigzaou.—A white fig from Kabylia.

A bois et fruit Jaspè—JASPER.

A bois Jaspè—JASPER.

Abondance—FRANCHE PAILLARD.

Abondance.—Said to be another name for VERSAILLES.

Abouh'archaou.—A white fig from Kabylia. Is not caprified.

Aboulil.—A white fig from Kabylia. Produces two crops.

Abouremman.—A black fig from Kabylia. Does not require caprification.

Abouzouggar.—A white fig from Kabylia. Requires caprification.

Adam.—Size medium, roundish turbinate, or flattened at apex, with short or no neck, which when present is distinct. Eye rough, with distinct iris. Scales rosy amber. Skin with distinct, shallow ribs, yellowish, with dingy brown flesh, dull, not waxy. Pulp dull amber to red. Meat thick, slightly rosy. Quality medium, but a very handsome fig when grown well. Leaves small, five-lobed, shallow, crenated, 6 inches long by 7 inches wide. Two crops. First crop above medium, turbinate, about 3 inches long by 2 inches wide. Neck medium to large. Stalk small. Eye large, with brown, protruding scales. Color of skin dull green, with a violet flush along the ribs and on the sunny side. Meat yellow. Pulp amber-white, with brown streaks.

A very handsome as well as good fig, desirable on account of its brebas. The second crop is less desirable. The first crop is excellent around Niles, Cal.

Adriatic—*Grosse Verte; Nebian; Nubian* (?); *Fico di Fragola; Strawberry Fig; Verdone* (Rome); *White Adriatic; Parker's Smyrna; Delamater's* (California).—Size above medium; shape variable, more or less rounded turbinate; the first crop more round than the second crop. Neck medium, stalk short. Ribs obscure. Eye open, with red iris. Skin very thin, greenish in shade, in sunlight bright greenish-yellow or yellow, according to locality where grown. Pulp bright strawberry red or in some localities violet-dark red with violet streaks in the whitish meat. A good and strong grower with large, shady, round head. Leaves deeply 5-lobed, oblong, bright, glossy green. Two crops. The first crop drops or if it stays is small and of poor quality, and ripens frequently with the second crop. If caprificated the first crop matures and becomes of very good quality. (Pl. XIV.) Extensively planted in California. Should never be planted extensively except where it is known to do well.

A fig of varying qualities, according to the locality where grown. Prefers rich, alluvial soil, not too moist. Most excellent at Atwater and in the vicinity of Niles, and in many other localities in California. Better in the foothills than on the interior plains. In wet places the fig bursts and sours badly. In localities where the fig does well it must be considered as one of our very best figs. It is not identical with the fig known as Adriatic in Italy. The three names under which it has been known in California were given by growers who desired to sell young trees or cuttings. It was introduced into California from Italy by very early settlers in the fifties, one of the first trees being planted at Big Oak Flat, in the Sierra Nevada foothills. In most localities this variety will be superseded by better kinds.

Agen—*Grosse du Draguignan.*—Medium, rounded turbinate, flattened at apex; skin thin, green with a brownish tint; a deep brown chocolate with mixed green around the apex. Eye open, iris reddish brown. Pulp dark red, very sirupy and sweet. One of the best figs, where it does well. Should be tried everywhere. Ripens very late. Requires caprification at Niles.

Ajenjar.—A black fig from Kabylia. Bears two crops.

Albi primaticci—ALBO.

Albicello—ALBO.

Albicougris—BORDEAUX.

Albo—*Bianchetta; Biancoletta* (Porta); *Albi primaticci; Ficus carica* var. *luteus* Aldr.; *Albicello* (Toscana); *Mattaro* (Lunigiana); *Fico Dorato* (Altrepo Pavese); *Biancolini* (Milan); *Fichi d' Oro* (Piacentino); *Moscadello* (Como); *Fico zentil* (Verona); *Gentile* (Bologna).—Size 2¼ by 2¼ inches or over. Shape round-obtuse, and flattened at apex. Largest diameter at apex or below center, no neck, stalk medium. Ribs in mature fruit indistinct. Eye medium, open, scales large, amber-rose. Meat white, pulp amber with a few large seeds. Skin bright yellow, more so than in most other figs, not excluding the GENTILE. Leaves large, 3 to 5 lobed, much longer than wide, the end lobe being pointed, margins wavy, surface quite hairy or pubescent, more so than most other varieties. Growth of tree medium. Two crops, the brebas being larger and more flattened than the second crop. One of the best Italian figs, generally cultivated all over that country, and only inferior in quality to PISSALUTTO and DOTTATO. Prefers moist and rich soils, and especially sandy loams. It is the cherished fig in the markets of Pavia and Milano, where it is sold under name of *Biancolini* or *Moscadello.* (Fig. 35.)

Albo Master.—A white Italian fig.

Amarouna—*Amaroun; Ficus amara* (Risso); *Ficus dylo* var. *amarula*, Geny; *Bitter skin.*—Medium, 2 inches long, pyriform; skin reddish brown mixed with green. Very bitter when cracked. Pulp red. (Sept. to Oct.) Nice and Provence.

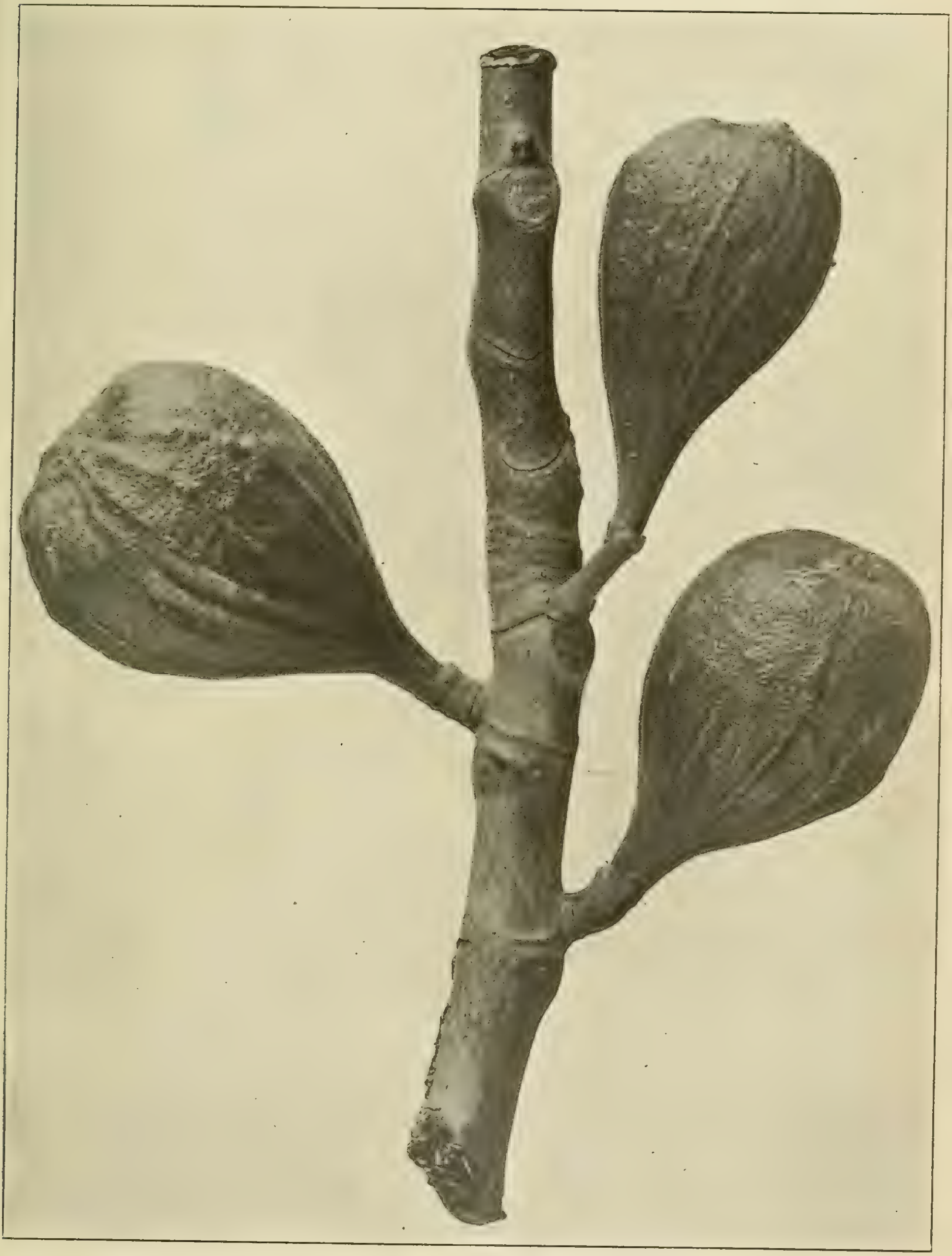
Amaroun—AMAROUNA.

Angélique—*Courcourelle blanche; Angélique blanche; Melette; La Melette* (Roz.) according to Duhamel.—Medium, 1¾ by 1 inch, pyriform, longer than wide, ribs prominent; color yellowish white with long greenish spots. Pulp white, in center fairly rose. Leaves 5-lobed, crenate, lobes pointed. A good fig of fine flavor. Paris and Provence.

Angélique—ANGÉLIQUE JAUNE.

Angélique blanche—ANGÉLIQUE.

Angélique Jaune—*Yellow Angélique; Angélique* (Thomas Rivers & Son); *Vendome.*—Two crops resembling each other. Fruit large, pyriform, about 3 inches long by 1½ inches to 2¼ inches wide, variable in size and form. Neck distinct, with small or no stalk. Eye small or medium, open, with amber scales and no iris. Skin smooth, of a greenish-yellow to deep sea-green color, with scattered lighter specks. Many distinct but shallow ribs. A faint gray



CAPRIFICATED FIRST CROP ADRIATIC FIG, NILES, CAL., JUNE, 1901.

bloom between the ribs at the stalk end. Pulp varying from deep brownish amber to deep violet-brown amber, sometimes distinctly rosy. Meat greenish white. Pulp fine, juicy, sugary, and sirupy, but with little flavor. Leaves large, entire or trilobate, in which case the lobes are shallow. Tree a strong, handsome grower, with a dense crown and upright limbs. A most valuable fig and one of the best at Niles. The description is made from figs ripe October 8. This variety is distinct from Angelique, from which it differs in the size and form of the fruit, its deeper flesh or pulp, its larger and more entire leaves. This will probably prove a fine table fig, superior to the ADRIATIC. Hogg does not mention this fig, his description referring to the ANGELIQUE proper. These two figs can not be considered as nearly related varieties, but are quite distinct. The fig described above was originally received from Thomas Rivers & Son under the name of Angelique. The identification is made from descriptions of ANGÉLIQUE JAUNE by French nurserymen. (Fig. 36.)

Angélique Noire.—Size below medium, roundish or oblate, skin dark, flesh bright red, rich. Strong grower and moderate cropper. (Barron.)

Anouhalal.—A black fig from Kabylia.

Apple fig—SAN PEDRO, WHITE.

Ar'anim.—A white fig from Kabylia. Does not require caprification.

Ar'anim aberkan.—A black fig from Kabylia.

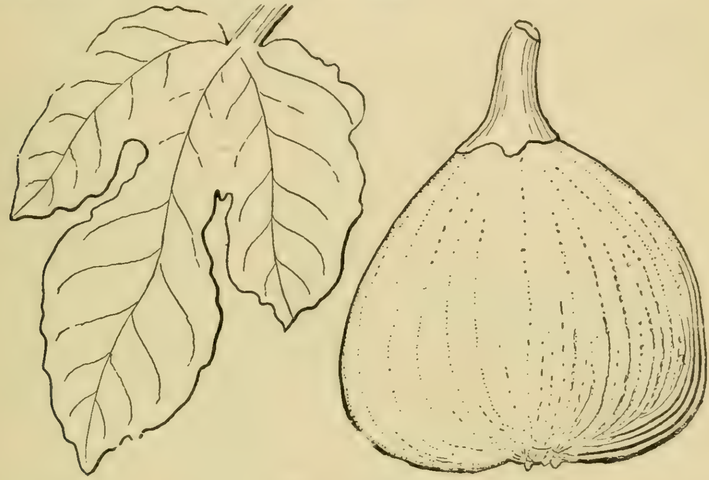


FIG. 35.—Albo fig.

Arbal.—Fruit medium pyriform, about 2 inches long by 1½ wide, tapering from the equator. Ribs many, indistinct, and irregular. Stalk very short, or none. Eye small, open, with small violet scales. Skin rather rough and downy. Color of skin olive green, mottled, and flushed with violet brown. Pulp clean amber with brown flush, fine and juicy. Meat white. Inner scales of eye rosy red. A fine, highly-flavored fig of insignificant appearance. Tree medium grower. Leaves medium or below, 5-lobed.

Arbauda—RUBADO.

Arbicone—SAN PEDRO, BLACK.

Archipel—*De l'Archipel.*—Large obovate, variable in size and shape, 2¾ by 1¾ inches or 2½ by 2¼ inches; neck short, but sharply set off. Ribs indistinct or indicated by lines. Eye flat, small, closed by pink amber scales surrounded by a rough iris. Skin smooth, especially around the eye. Color, olive green to reddish purple, mottled all over with minute, round, and larger oblong gray spots; near the stalk end the color is light olive green. Pulp tender, very pale or white opaline-amber; very fine, with small seeds. Meat white. Now and then there is a rosy fiber in the pulp. A very tender fig, but not highly flavored. Leaves medium to small, 3-lobed, deep green, rather glossy. According to English authors the color is more chestnut brown. First crop: Large, obovate, 3½ inches long by 2 inches wide. Ribs indistinct, outlined by violet streaks. Neck short and gradual. Stalk very short. Eye small with white, small scales closing the opening; a lighter-colored iris. Pulp and meat whitish amber. A sweet and juicy fig, without much distinct flavor, but of good taste. The skin is thin and cracks open readily at maturity. The first crop is a valuable and desirable one at Niles, Cal. One of the figs imported through the United States Department of Agriculture. Second crop.

Argenteuil—DAUPHINE.
Arguscla—DOUQUEIRA NEGRA.
Ashridge Forcing—BROWN TURKEY.

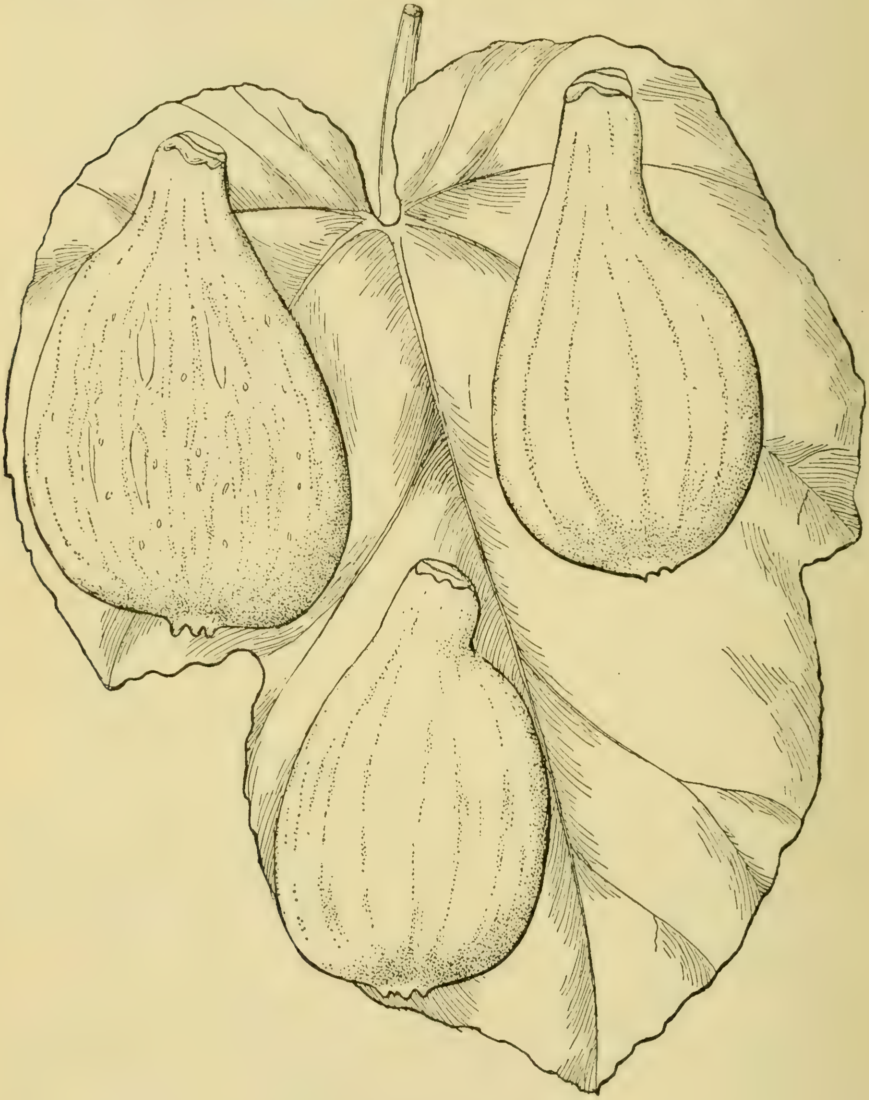


FIG. 36.—Angélique Jaune fig.

Athènes—*Figue d'Athènes; D'Athènes; Blanche d'Athènes; Marseillaise; Marseillasa; Burnham's Smyrna; Ficus marsiliensis* Garidel.—Small, roundish, or turbinate, 1¾ inches in diameter, with indistinct ribs at the stalk, depressed at apex. Skin rough, color whitish, flushed with yellow and green, no bloom. Pulp pale-red, opaline toward the stalk; very sweet but not highly flavored. One of the best drying figs of good drying and keeping qualities. This fig is distinct from the *White Marseillaise*, which possesses white or amber-colored pulp, and which is also an equally fine fig for drying. Cultivated in Provence around Marseilles, Nice, etc.

A Tres recolte—Possibly the same as TRIFERO.

Atwater.—Length about 2½ inches, width about 2¾ inches, of average large fruit. Stalk and neck very short; fruit flattened or sometimes slightly turbinate, with broad and indistinct ribs from stalk end, which in the zone of the eye become more numerous, narrower, and quite distinct to very distinct. Cheeks uneven, swollen, and somewhat angular. Slight bluish bloom. Skin very waxy, of a yellowish-green color, somewhat streaked yellow and green, the yellow predominating around stalk and eye; few white specks. Eye large, or very large, open scales protruding, of a brown color edged dingy white. Eye, except scales, rather flat or even sunk. Meat yellowish white, very thick or wider—indeed, in some figs thicker—than the pulp. Pulp, just before real maturity, pinkish, but at full maturity amber white, transparent; in some figs here and there flushed pink. First crop ripe by July 1. It is a very delicious fig, resembling PETERS WHITE, but has less pink in the pulp, while the latter has less vinous acid and is less flavored. PETERS WHITE is the superior of the two varieties growing side by side in Merced County, Cal. ATWATER ripens about one week before PETERS WHITE. Second crop is much smaller, but sweet.

The true name is not known, the present one being provisional only.

Aubico Blanco—TAPA CARTIN.

Aubique—SAN PEDRO, BLACK.

Aubique Blanche—TAPA CARTIN.

Aubique Leroy—France.

Aubique Noire—SAN PEDRO, BLACK.

Aubique Violette—SAN PEDRO, BLACK.

Aubiquon—SAN PEDRO, BLACK.

Aubran Blanc—France.

Auliguo—SAN PEDRO, BLACK.

Avarcugo—France.

Azagour guilef.—A black fig from Kabylia. Does not require caprification. The words mean hog's back.

Azaïcht.—A black fig from Kabylia. Bears two crops of figs. Does not require caprification.

Bagassa—MOURENAO.

Barbillanne—COTIGNANA.

Barbillonne.—Size medium, rounded, 1½ by 1½ inches, no neck, stalk short; ribs narrow, distinct wavy, especially on the cheeks; skin thin, rather wavy. Eye small, open, but not elevated nor prominent. Scales small, black. Skin very dark black, with violet reddish flesh and thin, violet bloom near the stalk. Pulp coarse, amber-white; seeds rather large, but few. Meat white. A very juicy fig grown at Argenteuil for Paris market. Leaves rather small, 5-lobed. First crop: Large to medium, round turbinate to pyriform, variable in size and form. About 3 inches long by 2½ inches wide. Ribs distinct. Eye very large, with many large, protruding scales. Neck distinct to nose. Color green, with a violet flush on the sunny side and on the apical part around the eye. Pulp sweet and juicy, as well as highly flavored; of a pale amber, with rosy streaks. Meat white, with rosy violet spots. Very fine brebas which can be highly recommended. A good bearing fig, which should be grown for its brebas, as the second crop is much inferior to the first crop. (Fig. 37.)

Bardakjik—*White Bardakjik; White Baltadjik; Bartadjic.*—Large, oblong pyriform, with long stem and neck. Color beautiful sea green. One of the very best of all figs. Grown extensively in the Smyrna district, where it is valued higher than any other for eating fresh. Soft and flabby. Meat and pulp blood red; when dried the pulp becomes very dark. Skin is very thin and delicate. It is one of the leading varieties for drying in the Aidin district. (See Smyrna figs, p. 278.)

Bardakjik, Black—*Bartakjik; Black Bardakjik.*—Large, oblong, pyriform, black. A very fine table fig from Smyrna, Asia Minor, where, with the White Bardakjik, it is considered one of the very finest table figs. It will also dry well. (See Smyrna figs, p. 278.)

Bargenron.—About 1¾ by 1¾ inches. Oblong or subrotund. Color pale violet on yellow ground. Pulp red. A very late fig. Good flesh, as well as dry. Requires dry soils.

Barnique.—South of France.

Barnissenca—BERNISSENCA.

Barnissenque—BERNISSENCA.

Barnissoto—BARNISSOTTE, BLACK.

Barnissotte—BARNISSOTTE, BLACK.

Barnissotte, Black.—*Black Barnissotte; Barnissoto; Barnissotte; Black Bourgassotte; Bourjassotte Noire; Brogiotto Nero; Brogiotto fiorentino; Grosso figo; Bellegrade; De Bellegarde* (according to Hogg); *Ficus barnissote*, Tournefort and Risso: *Ficus erin.* var. *jucunda*. Geny: *Ficus polymorpha* Gasparini var. *depressa.*—Medium, 1⅝ to 1¾ inches by 1½ long; broader than long, flattened at apex, with no neck or very slight neck and rather uneven cheeks. Ribs distinct and even, well protruding, but not as much so as in RABY CASTLE, but quite distinct from stalk to apex. Eye sunk, closed, with slightly protruding iris and with a few large brown scales. Skin waxy, dull, not downy, of an even black color with a violet flush and reddish hue in the shade. Bloom clear blue extending in a zone from the stalk halfway down to the apex, but sometimes confined to the vicinity of the stalk. Meat pink, the interior of the stalk and neck bright yellow. Pulp deep blood red. A very late fig; September until frost. First crop somewhat larger, skin rougher and pulp more yellowish. Rare. Leaves 3-lobed, almost entire with undulating margins of medium size densely covering the branches. A most excellent fig and one of the very finest for table. Italy, southern France, Spain, etc. (Fig. 38.)

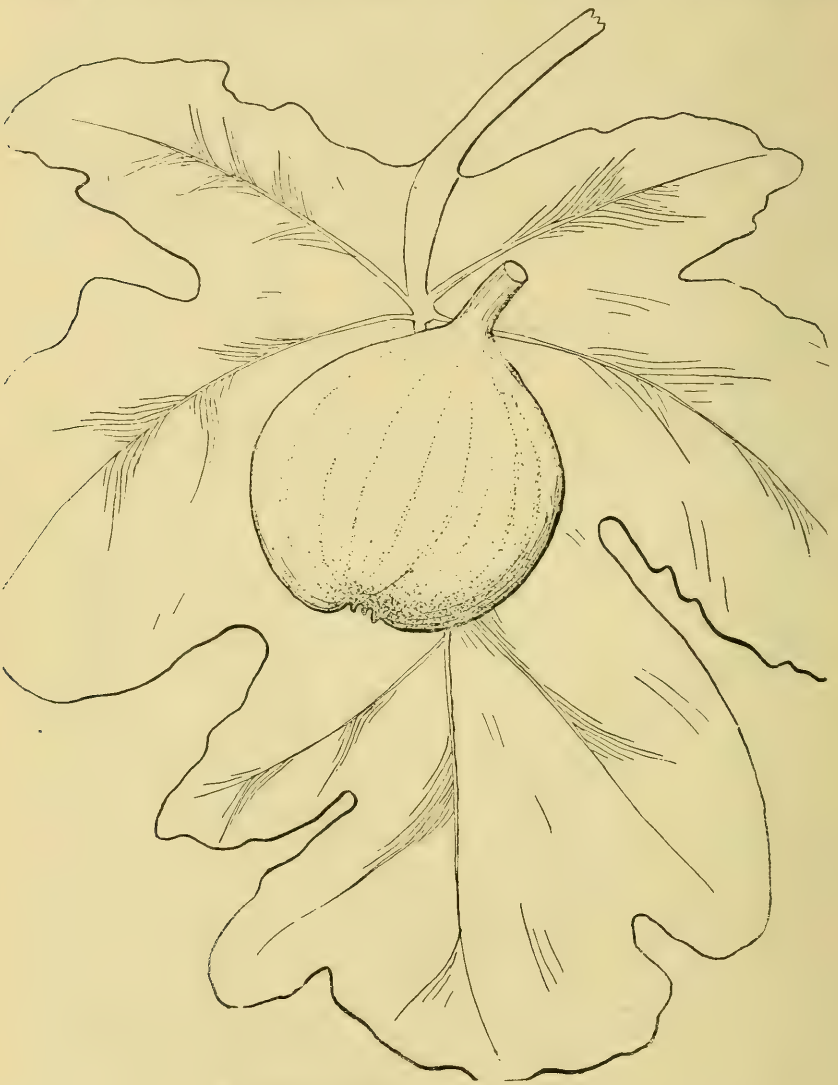


FIG. 37.--Barbillonne fig.

Barnissotte Blanche—BARNISSOTTE, WHITE.

Barnissotte Grise.—Medium to small. Rounded turbinate without neck and with very short stalk. Ribs narrow and shallow. Skin waxy, of a sea-green color mottled dark gray, with some bloom. Eye closed with rough iris. Pulp violet red. Meat whitish, juicy, and sweet. Tree a strong grower, with rounded head. Leaves small, 3-lobed.

Barnissotte, White—*White Barnissotte; Barnissou Blanc; Bourjassotte Blanche* (France); *Barnissotte Blanche; Brogiotto Bianco; Brogiotto Genorese* (Italy); *Bourgassotte; Bourgeassotte; Ficus grandis* Sauvaigo.—Second crop medium, roundish turbinate, a little longer than the Black Barnissotte; ribs distinct but few, neck very short, no stalk, obtuse at apex, with swollen cheeks; 2½ inches in diameter at the base; skin waxy, but not glossy, easily detaching from the pulp; color green, evenly diffused. Eye large, sunk and closed; scales large, unequal, of bright rose color, standing out. No iris. Pulp bright red, very sweet and honey-like, refreshing. First crop very rare, observed and described a few times only by Gallesio in 1816 and 1826. Earlier than the Black Barnissotte. Leaves 3-lobed, almost entire. One of the largest fig trees, said to have been introduced into Europe from Syria by the Genoese during the crusades. A most excellent fig for the table. France, Spain, and Italy, or generally distributed along the Mediterranean. There appear to be two forms of the fig, one much longer than the other. The variety described by Bernard is given a length of 1½ by 1¾ inches. The name may be applied properly only to the short variety, which is only slightly longer than the Black Barnissotte. First crop requires caprification. (Figs. 39, 40.)

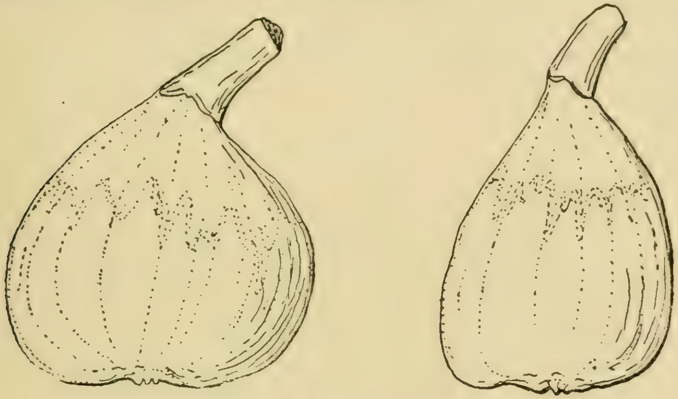


FIG. 38.—Barnissotte, Black fig.

Barnissou Blanc—BARNISSOTTE, WHITE.
Bartakjik—BARDAKJIK, BLACK.
Bartadjic—BARDAKJIK.
Bayswater—BRUNSWICK.

Beaucaire—*Figue Grise; Grisette; Celestine; Grisette Hâtive; Gray fig.*—Two crops. First crop: Fruit large, pyriform; color of skin violet gray; pulp rose; quality good. Second crop: Smaller, of medium size, more oblong; color of skin ashy gray; pulp deep red; fine flavor. A fig valued in France for its earliness and fine flavor. It is different from CELESTE, which is a small fig and of a deeper bluish color. Entrecasteaux, France.

Bec de Perdrix.—Below medium, pyriform, with long neck. Ribs longitudinal, plain; stalk short, about one eighth of an inch. Color of skin dark purple, darkest around the eye of crown, shading toward the stalk. Fine blue bloom on shaded side. Pulp sirupy, stiff, very dark rose. A good drying fig. Southern France and Spain. (Hogg.)

Bellegarde—BARNISSOTTE, BLACK.

Bellona.—Two crops. First crop is very light, large, 3½ inches long by 2¼ wide; pyriform, violet gray or yellowish mixed with green; pulp pale red, very sweet. Second crop: Smaller, 2½ to 3 inches by 2¼ inches, oblong-rounded but variable in form; widest at apex, which is flattened. Skin thin, cracking at maturity; eye elevated, of reddish color. Color of skin blackish violet mixed with green and red. Pulp red, very sweet; not very thick, but very fine. August to October. Tree wider than high, with large, drooping branches touching the soil, where they frequently take root. Leaves very large, 3 to 7 lobed, pointed, deeply crenated. Requires moist and rich soil: in dry soil the pulp becomes pale. Extensively grown in Provence, especially in the Alpes-Maritimes, where it is valued as the "Queen of figs." It is unsurpassed as a fresh fig, and is also of good quality when dry. A most valuable fig which can not be too highly recommended. In the vicinity of Nice BELLONA plays the same part as the MARSEILLAISE in Provence, as the DOTTATO in Toscana, as the VERDONE at Rome, as the TROJANO at Naples, or as the LAMPEIRA in Algarve, Portugal.

Berdauda—GROSSE BEURDOUA.

Bernade.—France and Italy.

Bernissenca—*Barnissenca* (Nice); *Barnissenque* (Provence); *Ficus garideli* Risso.—Below medium, about 1¼ by 1½ inches. Almost round, with a slender neck, lopsided. Skin thin, milky, adhering to the pulp. Color violet brown; pulp red, watery, slightly bitter; quality medium to fair; but valuable as a late fig. Leaves 3-lobed, with undulating margins, lobes rounded. Moist soils. One of the latest figs, sometimes ripening all through winter or early spring before the brebas. Nice and Provence.

Bernissenque—VERNISSENQUE.

Bertolina—CAIANA.

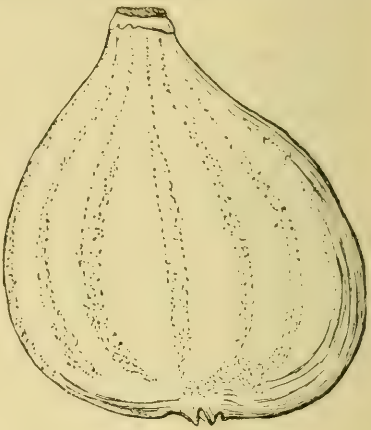


FIG. 39.—Barnissotte, White fig.

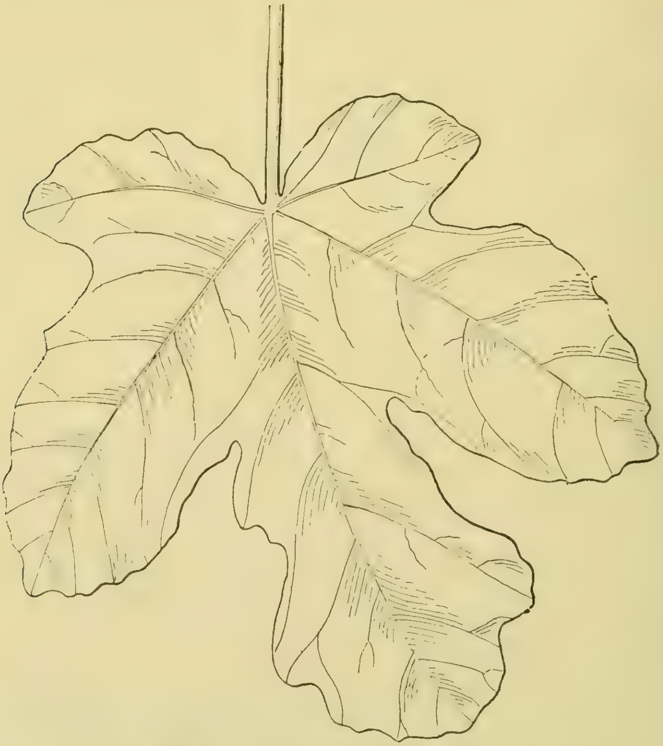


FIG. 40.—Leaf of Barnissotte, White fig.

Betada.—Small, rounded, inclining to oblate; skin black, shading off to paler toward the stalk, where it is decidedly greener. Eye closed, flat stalk short; pulp sirupy, pale rose. Rich and excellent. (Hogg.)

Bianca Morcati—Italy.

Bianchetta—ALBO.

Biancoletta—ALBO.

Biancolini—ALBO.

Biancotondo Grossissimo.—Largest size: white, for table. Possibly identical with GENTILE. Italy.

Biberaeao.—Size 3 by 1½ inches, oblong. Neck tapering, short; stalk short: skin smooth, rather waxy: few and indistinct ribs: eye closed. Scales reddish pink, small: meat white; pulp brown with a reddish flush; seeds small. Color dark bluish-black, with a dull bloom. Leaves medium, 3 to 5 lobed, lobes rather deep, with wavy margins: stalk long. Provence. Tree strong, with rounded head. Not identical with DOURO VEBRA, which is a much smaller fig.

Bifère Blanche.—Small, white table fig: good bearer, but medium quality. France.

Bifère de l'Archipel.—France. Not identical with DE L'ARCHIPEL.

Bifère de la Malmaison.—Size below medium; round, sometimes oblong, lopsided, one side of apex hanging down below the other: no ribs; stalks stout: skin pale brown streaked with purple, with thick gray bloom: eye closed: pulp tender, juicy, but not finely flavored, pale rose to red. A very rich fig.

Binelli—DOTTATO.

Binellino—DOTTATO.

Bitter Skin—AMAROUNA.

Black and White—BLANCHE ET NOIRE.

Black Bardakjik—BARDAKJIK, BLACK.

Black Barnissotte—BARNISSOTTE, BLACK.

Black Bourgassotte—BARNISSOTTE, BLACK.

Black California—MISSION.

Black Coucourelle—COUCOURELLE GAVOTTE.

Black Douro—DOURO, BLACK.

Black Ischia—ISCHIA, BLACK.

Black Marseillaise--MARSEILLAISE, BLACK.

Black Martinique—MARTINIQUE.

Black Mexican—MISSION.

Black Mission—MISSION.

Black Mussega—MUSSEGA NEGRA.

Black Naples—Given by Hogg as synonym of BRUNSWICK, which is probably not correct.

Black Pissalutto—PISSALUTTO NEGRO.

Black Provence—MARSEILLAISE, BLACK.

Black Rondella—RONDELLA NEGRA.

Black San Pedro—SAN PEDRO, BLACK.

Black Spanish—GENOA, BLACK.

Blancassa—*Ficus albida* Risso; *Ficus carica* var. *fodercana* Geny.—Two crops. First crop: Subglobular; skin rough: color greenish white, flushed with yellow, 1¾ to 2¼ inches: pulp pale rose, shading to white. Second crop: Subpyriform, rounded, greenish yellow; larger than the first crop, 2½ by 1¾ inches. Pulp red.

Blanche—*Blanche d'Argenteuil: Blanche Hâtive: d'Argenteuil: Grosse Blanche Ronde: Blanquo* (Provence).—Two crops. First crop: 2½ by 2¼ inches long, round, slightly turbinate, flattened at apex; stalk short, no neck: ribs prominent: eye medium, open: color of skin greenish yellow: pulp amber white, with a few large seeds. Second crop: Fruit small, turbinate, flattened at apex, about 1½ inches diameter. Skin rough, with shallow, indistinct ribs. No neck and very short stalk. Eye small, flat, open or closed. Color of skin yellowish green, with white seams when ripe. Pulp amber white, with small seeds, very juicy, finely grained and sweet. No trace of pink. Tree moderately small. Leaves small, 3-lobed. Even the second crop, though smaller, is of a very fine quality. This fig does not seem to belong to the Marseillaise class. Extensively cultivated at Argenteuil for the Paris market. This fig is the oldest fig introduced to Argenteuil near Paris. It is said to have been brought there during the time of Julianus Apostata, the Roman Emperor. (Fig. 41.)

Blanche d'Argenteuil—BLANCHE.

Blanche d'Athènes—ATHÈNES.

Blanche de Toulouse—*White Toulouse.*—Large, oblong: very good. A white variety common around Toulouse, in France.

Blanche de Versailles—*White Versailles.*—Fruit small, white, and early. Grown in northern central France for the Paris market.

Blanche et Noire—*Black and white.*—A mottled fig, interesting on account of its color, but otherwise of no great importance.

Blanche Hâtive—BLANCHE.

Blanche Ronde—*Round white.*—Most varieties with such names as "Round White," "Long Black," "Long White," etc., refer in different localities to entirely distinct varieties. Such names should be discarded, as they serve to confound the nomenclature without precisely indicating the variety and without the possibility of identifying the variety except by careful comparison or transplanting. Such varieties as a rule are also less valuable, as valuable figs are generally given different and distinct names.

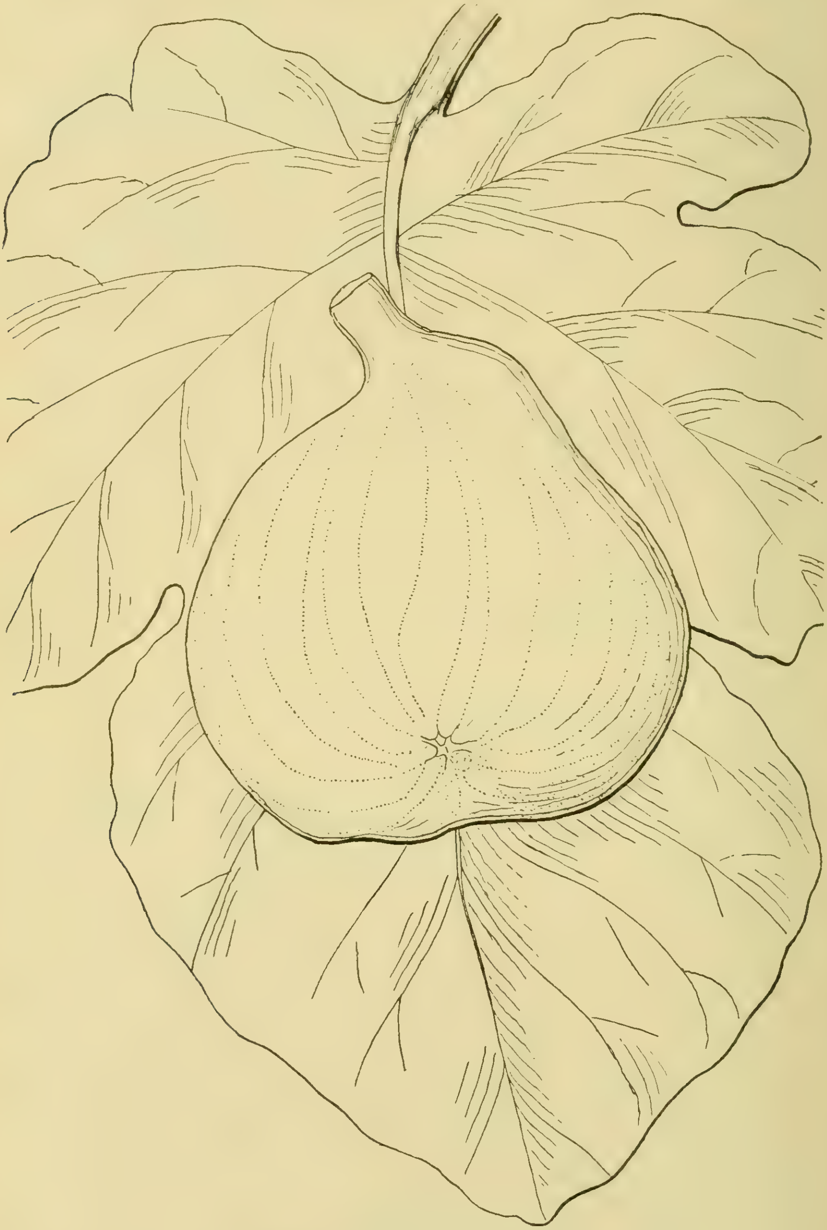


FIG. 41.—Blanche fig—first crop.

Blanche Jaune.—Above medium, oblong, skin yellow, dotted white. France.

Blanchette—ROLANDINA.

Blanquette—LIPARI.

Blanquetto—LIPARI.

Blanquette Grosse—A large variety of LIPARI.

Blanquo—BLANCHE.

Blavette—COTIGNANA.

Blowers. (See Smyrna figs, p. 278.)

Blower's Smyrna—BLOWERS.

Blue—BROWN TURKEY.

Blue Burgundy—BROWN TURKEY.

Blue Celeste—CELESTE.

Blue Ischia—ISCHIA, BLACK.

Bocarde.—Medium size; blackish brown; pulp, deep rose; very good. France.

Bodoni.—Large; two crops. France.

Bonafoux.—France.

Bondance Précoce.—Size below medium; 1½ by 1½ inches; round, uneven; neck distinct, but short; stalk none, or very short; ribs distinct, few, slightly elevated; eye small, sunk, with a very small but distinct opening, and a slightly raised iris; scales few, medium size, color rose; skin rough, hairy, color muddy amber brown, with a darker flush in the sun and yellowish-red in the shade; light bloom around stalk. Pulp rose, very sweet and juicy; meat, amber white, very fine quality. A darker fig than the Brunswick; leaves oblong, medium, about 8½ by 5½ inches, 3 to 5 lobed. (Fig. 42.)

Bonisotte Blanche—BOURDISOTTE, BLANCHE.

Bonne Dame.—A very early French fig.

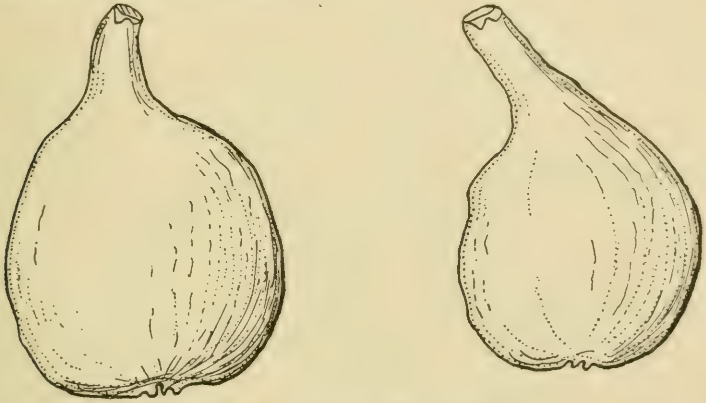


FIG. 42.--Bondance Précoce figs.

Bontard.—Size below medium; 1½ by 1¾ inches long; neck short, tapering; stalk short; ribs few, but rather elevated, wavy, reaching the eye. Eyes small, depressed, open; scales few, large, amber; skin rather rough, yellowish-green with pale bloom. Pulp not fine, rosy pink; leaves above medium, 5-lobed, with only short spurs. Surface rough and coarse. Leaves longer than wide, the end lobe being the longest. The variety received from the Royal Horticultural Society differs a little from the above, and may be described as follows: Size medium, turbinate, about 2¼ inches long by 1¾ inches wide, but with short, distinct neck, or none; stalk very short; ribs few and indistinct; skin downy, light yellow and green, with faint bloom; eye small, open or closed, with amber scales; no iris, flat. Pulp rose to amber, usually coarse and uneven, but sometimes fine amber, fine-grained; meat thin, white, juicy, and sweet, vinous but not rich; light green, without shade of other colors. Leaves small, wider than long, light green, 3-lobed, with short spurs. A good fig.

Bontalette—*Bontillette.*—A white drying fig. Brignoles, France.

Bontillette—BONTALETTE.

Bordeaux—*Petite Aubique; Petite Aubique Violette; Petite Figue Violette, Albicougris; Ficus erin.* var. *cinerescens* Geny; *Figue Poire; Fiquo Aubiquon.*—Two crops: Second crop best; above medium, about 3¼ by 2 inches. Pyriform, with very narrow neck and medium long stalk. Eye medium, raised, with red iris; skin not smooth, of a velvet brown color shading to ashy gray, spotted clear green on the neck, which is well set. Leaves 5 or 7 lobed, with long, narrow lobes, crenate, pointed. Requires moist ground, as it suffers from coulure (dropping) in dry soils. The Bordeaux is a very good fig, with two crops. Common around Bordeaux and Nagronne in southern France; generally confounded with Aubique, which is a much larger fig and synonymous with San Pedro. A distinction must be made between the *Petite Aubique* and the *Aubique*, the former being identical with our BORDEAUX, the latter with BLACK SAN PEDRO, which is synonymous with *Grosse Violette de Bordeaux*. **(Fig. 43.)**

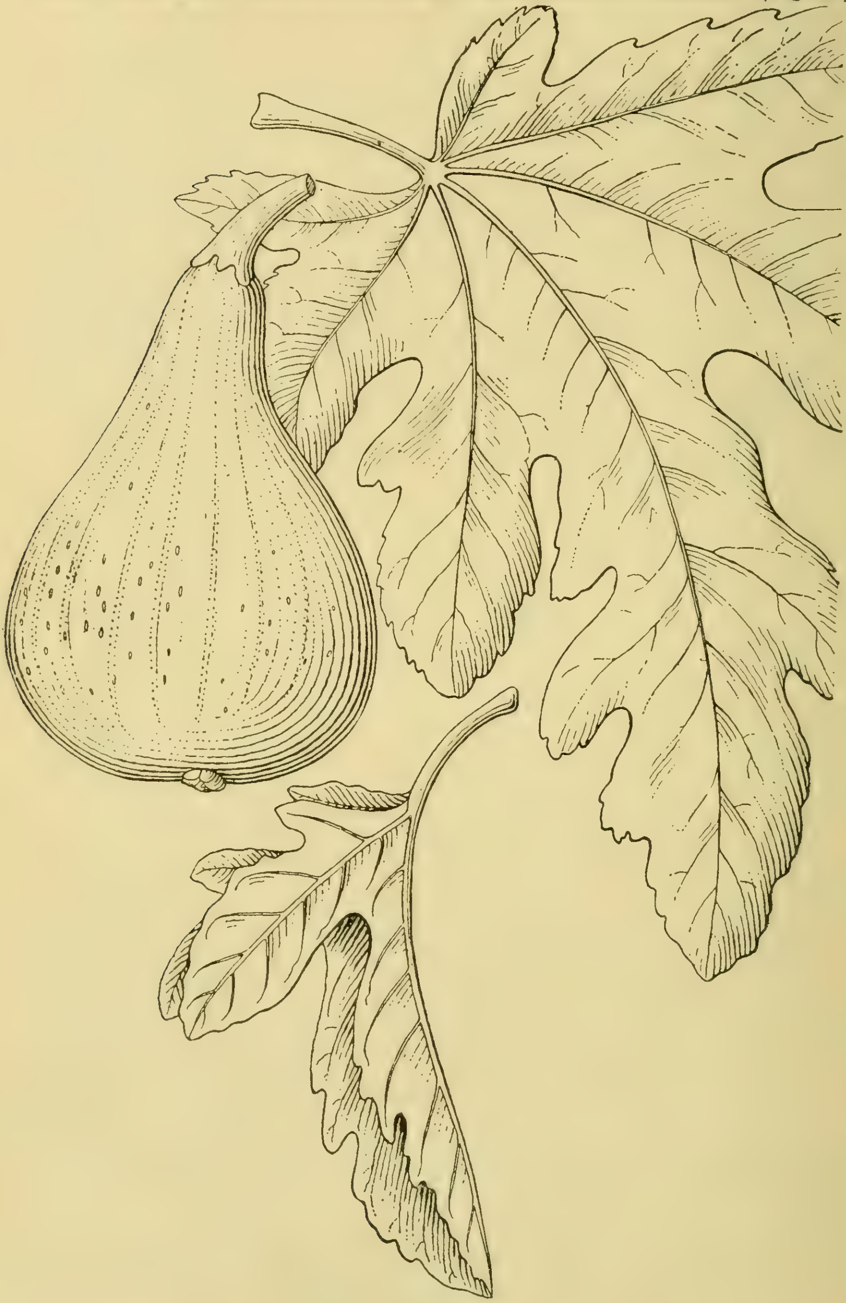


FIG. 43.—Bordeaux fig.

Bordeaux—SAN PEDRO, BLACK.
Bouche Barrique—TAPA CARTIN.

Boughton.—Synonym of BRUNSWICK, according to Barron.

Bouin—*Bovin; Figa Bovin; Ficus bovina* Risso.—Above medium, 3¼ by 1⅝ inches. Shape oblong, twice as long as broad; broadest at apex. Skin adhering to the pulp, greenish yellow with a raised red eye, surrounded by a red star-shaped iris. Pulp bright red. A good fig. Nice and Provence.

Bouissonne—MOUISSOUNA.

Bourdisotte Blanche—*Bonisotte Blanche.*—Small, round, inclining to turbinate; stalk very short; ribs prominent; eye large and open: color of skin green or yellow when fully mature, with a delicate white bloom. Pulp pale rose, rich, and sweet. A good French drying fig.

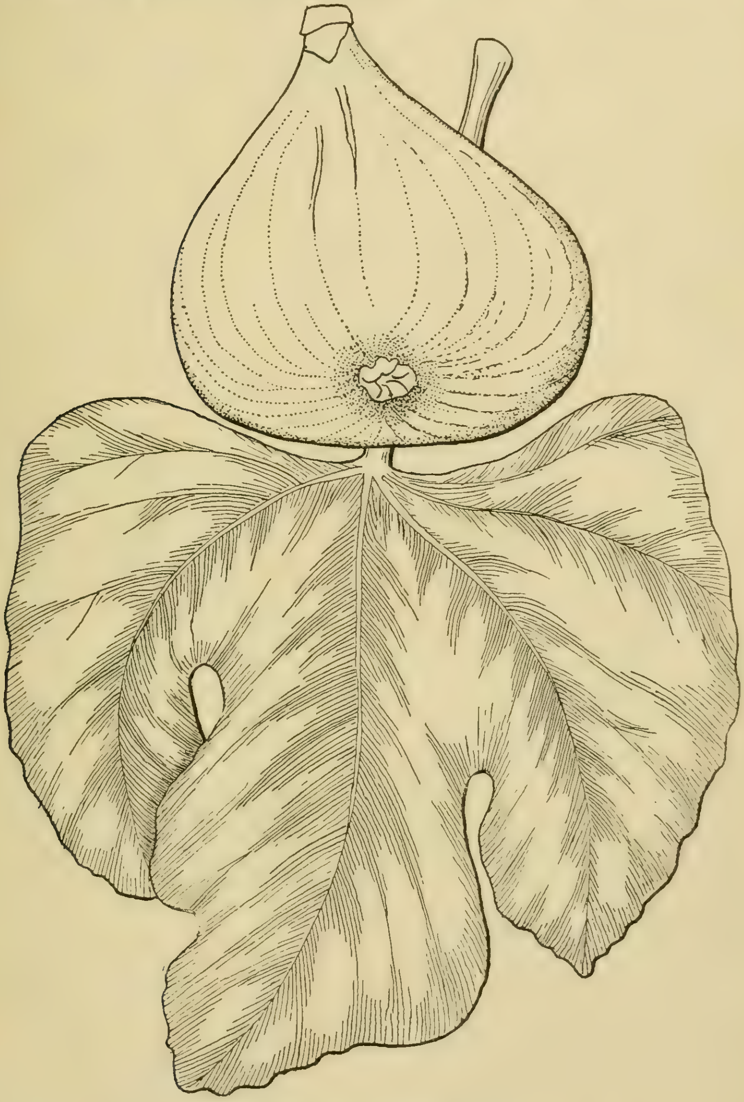


FIG. 44.—Bourdissotte Noire fig.

Bourdisotte Noire.—Medium, shape roundish turbinate; very short neck; stalk very short; ribs prominent, very even and regular; eye open, small, round; skin purple, with a thick, gray bloom. Pulp deep flesh-colored, with a thick vein of white nearest the skin. A sweet but not flavored fig (Hogg). The Bourdisotte must not be confounded with the *Barnissottes* or *Bourjassottes.* (Fig. 44.)

Bourdou—GOURAUD NOIRE.

Bourgassotte—BARNISSOTTE, WHITE.

Bourgeassotte—BARNISSOTTE, WHITE.

Bourjassotte Blanche—BARNISSOTTE, WHITE.

Bourjassotte Grise.—Size medium; roundish, flattened, almost oblate; skin dull brown or tawny, with patches of purple. Pulp deep red; very rich and luscious. The most constantly good fig grown in English hothouses, and a good cropper, according to Barron, who gives this fig as a different one from *Barnissotte Grise.*

Bourjassote Noire—BARNISSOTTE, BLACK.

Bourraillese—GOURAUD NOIRE.

Boutana.—Size medium or above medium; pyriform to oblate, with an oblique axis. Stalk short, one-eighth inch long; ribs extending to apex; skin dull or tawny green, with no bloom, but downy. Pulp deep rose, but not dark. (Barron and Hogg.)

Boutilete.—For drying. At Brignoles.

Bouton du Guêtre—LIPARI.

Bovin—BOUIN.

Brayasque—BRIASCA.

Brayasque—BRIASCA DOUSSA.

Brebas.—Brebas is a Spanish name for any first crop of figs and is applied to figs of any size and color. It corresponds to "fiore," "figues fleures," etc., and does not refer to any certain variety, meaning early. The variety imported by Professor Pohndorff from Spain to California, under the name of "Breba," is the San Pedro White, which, as is well known, matures only the first crop. From Prof. E. W. Hilgard the author has learned that another fig is also sold in Malaga as Brebas, but the fig is very much larger, oblong, and exceedingly handsome, and yellow. In Mexico the popular idea is generally that the "Breba" is a special kind of fig.

Breba Negra—SAN PEDRO, BLACK.

Breba (erroneously)—SAN PEDRO, WHITE.

Brianchetta—ALBO.

Briancoletta (Porta)—ALBO.

Briasca (Nice)—*Brayasque* (Provence); *Ficus sylvestris* var. *festinatissima* Geny.—First crop 2½ inches long by 1¾ inches wide; pyriform, rounded, eye reddish, protruding; skin reddish-brown; pulp red. Nice and Provence. (Fig. 45.)

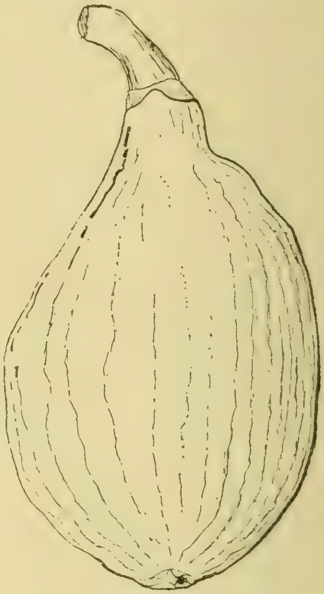


FIG. 45.—Briasca fig.

Briasca—ROLANDINA.

Briasca Doussa—*Sweet Briasca; Brayasque; Ficus dulcissima* Risso; *Sweet Brayasque.*—Above medium; 2½ inches long by 1½ inches wide, with very short neck and short stalks; skin shining, blackish purple, shaded red; pulp reddish but pale. The figs, known as "buffros," are very early and sweet, but poor in taste. Leaves 3-lobed. Draguignan and Provence, France.

Brizanzola.—Italian fig.

Brocket Hall—ISCHIA, WHITE.

Brogiotto Bianco—BARNISSOTTE, WHITE.

Brogiotto Genovese—BARNISSOTTE, WHITE.

Brogiotto fiorentino—BARNISSOTTE, BLACK.

Brogiotto Nero—BARNISSOTTE, BLACK.

Brown Coucourel—COUCOURELE BRUNE.

Brown Hamburgh—BRUNSWICK.

Brown Italian—BROWN TURKEY.

Brown Naples—BROWN TURKEY.

Brown Turkey—*Ashridge Forcing; Blue; Common Blue; Blue Burgundy; Brown Italian; Brown Naples; Long Naples; Early Howick; Italian; Large Blue; Lee's Perpetual; Murrey; Purple; Fleur Rouge; Walton; Turkey, Brown* (all synonyms according to Hogg).—Large size. Turbinate-pyriform with small but hardy distinct neck; stalks short or variable; fig flattened toward apex; ribs few, slightly elevated; eye medium, slightly open; scales large, rosy brown, all depressed; raised iris. Skin smooth, greenish in shade, violet brown in the sun, with darker ribs. Pulp dark rosy red, seed small, good quality. A good bearer. The fig generally known as *Brown Turkey* in California, and elsewhere in America as the BRUNSWICK. (Figs. 46, 47.)

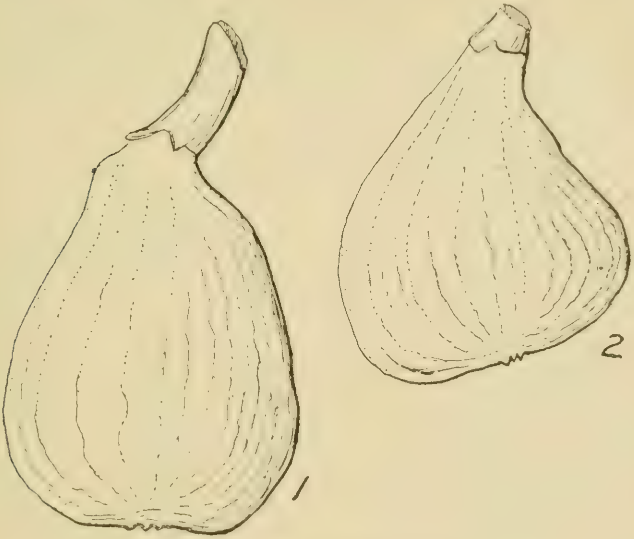


FIG. 46.—Brown Turkey figs.

Brunswick—*Bayswater; Boughton; Brown Hamburgh; Clementine; De St. Jean; Hanover; Madonna; Red; Large White Turkey; Black Naples* (?).—All these synonyms and some others are given by Dr. Hogg. Two crops. First crop very large, pyriform, rather cylindrical, with swollen cheeks, one of which is the larger; apex very obtuse, neck and stalk very short; ribs distinct, but not much elevated, few and broad. Eye medium, hardly elevated, open; iris slightly darker, with amber-rose scales. Skin pale amber with a violet tint: ribs darker violet, shading reddish; the shady side paler amber, toward stalk and neck greenish yellow; skin smooth, but not waxy; pulp amber. Second crop medium or below, otherwise not much different from the brebas. Tree is quite small, with straggling branches, deeply cut leaves, which on account of their small number as well as size give little shade. A very hardy fig, with large crops of medium quality. This fig, which is variously and erroneously known in California and in the United States generally as *Brown Turkey, Smyrna*, etc., was, until the introduction of the ADRIATIC, the most common white fig in the first-mentioned State. The very large dingy white and brown Brebas are the first figs in the San Francisco market, but they are watery, not sweet, and otherwise poor in quality, although very juicy. (Fig. 48.)

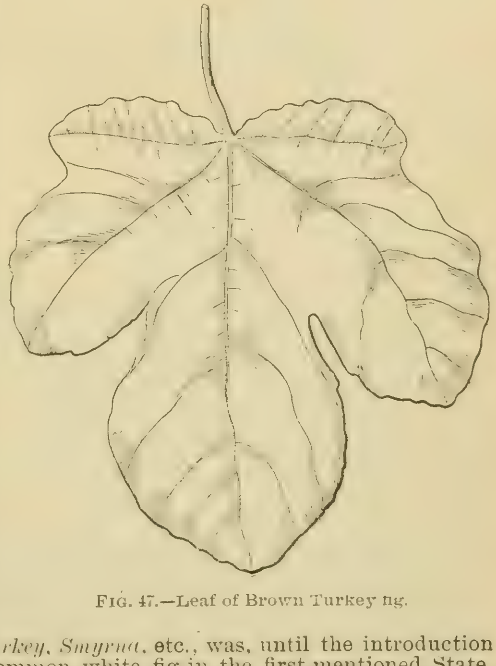


FIG. 47.—Leaf of Brown Turkey fig.

Bucuelle—France.

Bulletin Black—PURPLE SMYRNA. (See Smyrna figs, p. 279.)

Bulletin Smyrna—LOB INGIR.—Under this name four distinct varieties imported from Smyrna have been distributed by G. P. Rixford, of the San Francisco Evening Bulletin. For a history of these figs see "Early fig culture in California." It was soon found that the figs dropped regularly before maturity, and up to the year 1891 not a single fig had matured. That year some 30 figs were pollinated by Mr. E. W. Maslin and the author, all apparently arriving at full and perfect maturity, thus proving the value of the figs and their genuineness. Previous to this, however, most of the fig trees distributed had been destroyed as unproductive. (See Smyrna figs, p. 278.)

Burnham's Smyrna—ATHÈNES.

Cabroliana—*La Douqueiretta; Ficus carica* var. *flomantiana* Geny.—Second crop pyriform, greenish yellow, 2½ inches long by 1¾ inches wide. Pulp red. Nice and Provence.

Caiana—*Bertolina*, Eze; *Ficus caiana* Risso; *Ficus browni* Risso; *Ficus sylvestris* var. *africana* Geny; *Red Caiana*.—Small, 1⅝ inches diameter; turbinate; skin thin, downy, reddish violet, or violet red with a blue bloom. Pulp pale red, watery, somewhat bitter. Nice and Provence.

Caiana Blanca—*Ficus candoleana* Risso.—Similar to the preceding, but with greenish-yellow skin. Nice and Provence.

Calabresa—*Ficus sylvestris* var. *calabra* Geny.—First crop above medium or large, about 3 inches long by 2½ wide; pyriform; of a bright green, mixed with brown. Meat violet; pulp red. Nice and its vicinity.

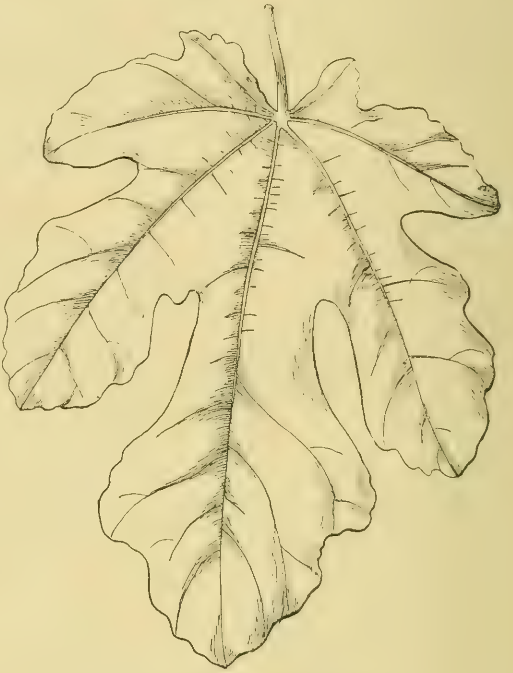


FIG. 48.—Leaf of Brunswick fig.

Calabria—DOTTATO.

California—MISSION.

Caprifig—*Carifiguier; Doukkar* (Kabylia); *Wild Fig*.—The wild fig of the Mediterranean region, with male, gall, and female flowers in the same fig, for all of which see special chapter (p. 74). There are a great number of varieties of this fig, differing in shape, size, and color of the fruit, as well as in the shape of the leaves, which in some are almost entire, in others very deeply lobed. Some varieties bear three crops a year, others two, and some only one crop. The varieties are suited to different localities. The caprifig is indigenous to southern Arabia, but has become wild in all Mediterranean districts, even in southern France. (Fig. 49.) For description of named varieties of caprifigs see p. 279.

Caravanchina Bianca—CARAVANCHINA.

Caravanchina Blanca—CARAVANCHINA.

Caravanchina—*Caravanchina Bianca; Caravanchina Blanca; Ficus sylvestris* var. *sublittoralis* Geny; *Ficus collina* Risso.—Two crops: First crop above medium; 3¼ inches long by 2 wide; pyriform, with long neck, heartshaped at apex. Eye prominent, reddish; skin greenish yellow; pulp red, white, and violet, with a violet inner skin. Second crop 1½ inches in diameter, turbinate, almost rounded; of a greenish yellow mixed with red. A good table fig. Nice and Provence.

Caravanchina Negra—*Caravanquin Negre; Fico ovata; Ovato; Ficus obovata* Risso; *Ficus sylvestris* var. *obovalis* Geny.—Second crop; oval-oblong, 1½ to 2 inches diameter; skin rough, shiny, blackish violet; pulp red. Italy and Provence.

Caravanquin Negre—CARAVANCHINA NEGRA.

Carbiani.—Table fig. Italy.

Carifiguier—CAPRIFIG. (See p. 279.)

Castagnola—*La Castagnola: Castagnolo* (Italy): *Ficus carica* var. *fucosa* Geny.—Globular: bright green: 1½ to 1¾ inches diameter. Savoy, at Nice.

Castagnolo—CASTAGNOLA.

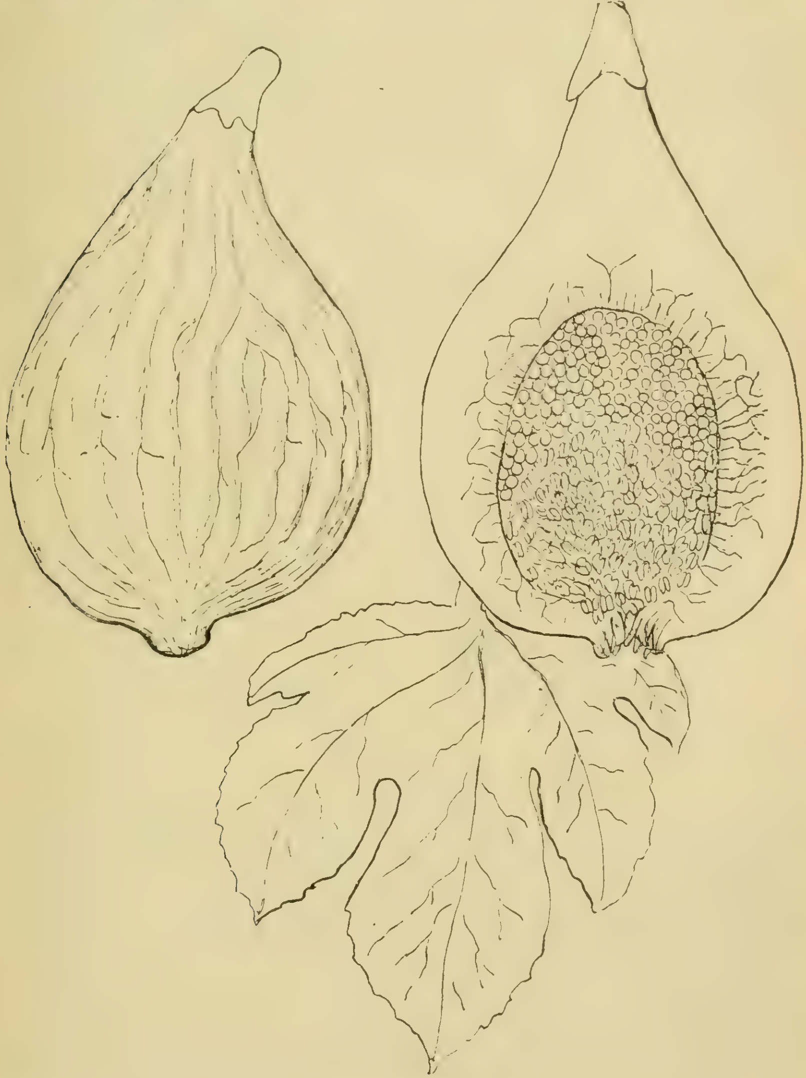


FIG. 49.—Caprifig from Italy.

Castle Kennedy.—Fruit very large, obovate or long pyriform; skin thin, very tender, greenish yellow on the neck and toward the stalk, but pale dingy brown, mottled with dull, dingy gray on the widest part and toward the eye: pulp pale, opaline, with slight stains of red around some of the seeds nearest the eye: tender, but not richly flavored. A large and handsome early fig, remarkable for its earliness, which is nearly three weeks ahead of the Marseillaise. The fruit greatly resembles Brunswick, but is entirely distinct in habit and growth of plant; abundant bearer; has been grown for more than a century at Castle Kennedy, N. B., England. (Hogg.)

Cassaba—KASSABA.—(See Smyrna figs, p. 278).

Catalan—*Ficus gallica* Risso.—Rounded, flat, bright violet: pulp red. Nice and the Riviera.

Cavajolo.—Italy.

Cavaliere.—Italy.

Celeste.—*Blue Celeste: Celestial: Celeste Violette.*—Small, 1¾ by 1¼ inches. Ovate-turbinate, with long and distinct neck; ribs few but distinct on body and around the apex, but not on neck: stalk variable, but always long—sometimes half as long as the body of the fig; eye raised, rough, closed with very small scales and elevated iris of the same color as the skin of the fig: color dark violet brownish amber, without any reddish flush, slightly paler toward the apex. The bloom, which is confined to the neck and upper part of the body, is bounded by a distinct and sharp line, and is thick and pale blue: skin very thin: pulp dark rose, fine grained; meat amber: sweet, but of poor flavor: tree a strong grower, erect, leaves medium to small, 3 to 5 lobed. (Fig. 50.)

Celeste Violette—CELESTE.

Celestial—CELESTE.

Celestine—BEAUCAIRE.

Cernica.—Medium, roundish turbinate: ribs shallow, but distinct: neck and stalk combined one-third the length of the fig: skin blackish violet, with blue bloom, not very thin; eye closed, with exuding honey when ripe; pulp deep red, oily, and sweet, but lacking in flavor; a black Dalmatian fig, Cernica meaning black; first introduced into California by G. N. Milco. Resembles Black Barnissotte.

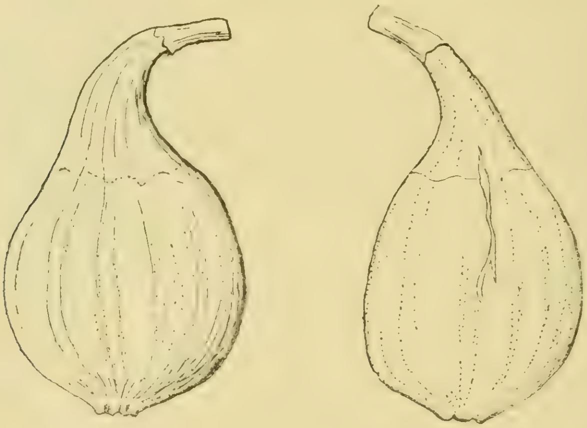


FIG. 50.—Celeste figs.

Charagine.—Medium, round, white. France.

Cheameghouar.—Very large, long and turbinate: skin red, pulp white. Algiers.

Chearlick—Asia Minor.

Chestnut-colored Ischia—ISCHIA, BROWN.

Chiajese.—Italy.

Chiattolatte—Italy.

Christmas fig—NATALINO.

Cierotat—France.

Cimeirenca—*Figa verdara; Ficus cemenelea*, Risso; *Verdara; Ficus erin.* var. *cemenelea* Geny.—About 2 to 2½ inches diameter, turbinate; skin thick, violet black; eye red; pulp purple; good, very productive. Originated near Cimiez in France according to Dr. Sauvaigo. There is said to be a Cimeirenca blanca at Nice, France.

Clare—*Doctor Hogg's Clare.*—Said to be a synonym of Brunswick. The fig sent in by the Royal Horticultural Society of London is a different fig. It is small, roundish, with no neck. Eye very large, splitting wide open. Skin smooth yellowish green, working in every direction. No ribs; pulp rosy, very pale, juicy; seeds very small; sweet, but no flavor. Leaves 8 inches long by 7 wide, 3-lobed, medium deep, sometimes two additional upper lobes.

Claveu—*Clou; Figa clou; Ficus clavicularis* Risso; *Ficus erin.* var. *longicaulis* Geny.—Two crops. First crop, large, 3½ to 4 inches by 1¼ to 1½ wide, pyriform, but very oblong, eye protruding, skin thin, of a uniform brownish black, pulp carmine red mixed with violet. Second crop: Turbinate, of about 2½ inches diameter. Nice and Provence.

Clou—CLAVEU.

Clementine—BRUNSWICK.

Cloverdale.—Small, about 1⅝ to 1⅞ inches: round pyriform, with a thin and distinct neck, broadest below the center towards the apex. Stalk medium, with large leaflets; ribs few, but well marked from and on the stalk, gradually disappearing on the body of the fig. Eye smooth, not sunk: scales large, rosy red, iris small or none: skin very smooth, greenish yellow, color evenly diffused. Pulp fine grained, red; meat white. The real name is unknown. Received from Mr. Truett of Cloverdale, Cal.

Coasco—ROLANDINA.

Cœur—CUERS.

Cœur des Dames—CUERS.

Col de Señora Negra—COL DI SIGNORA NIGRA.

Col de Signora—COL DI SIGNORA BIANCA.

Col de Signora Bianca Panachée—COL DI SIGNORA PANACHÉE.

Col des Dames—COL DI SIGNORA BIANCA.

Col di Signora Bianca—*Col des Dames; Coull de Dama; Col de Signora; Lucrezia; Ficus domina* Risso; *Ficus carica* var. *carmosa* Geny.—Two crops. First crop: Rare, glaucous green-shaded yellow. Second crop: Medium, about 1½ by 3 inches, widest diameter near the apex. Shape oblong, pyriform, with a very long, well-set, and narrow neck, rather twisted and bent; stalk very short and stout; apex obtuse; ribs longitudinal, regular, and very prominent; eye closed, with red scales; color, greenish yellow, changing to greenish white, with a fine gray bloom. Skin thin, but hard, detaching itself from the pulp, which is very dark red, thick, and sirupy. Ripens very late—September to frost. The bearing qualities of this fig tree are poor, but the quality of the fig is very superior, it being one of the finest of figs, both fresh and dry, worthy of cultivation in any country. Widely distributed along the Mediterranean.

Col di Signora Nigra—*Col de Señora Negra.*—Medium size, 2¾ inches by 1¾ inches. Shape ovate pyriform, obtuse at apex; neck very narrow and long, curved and swollen towards the stalk end. Stalk very short, almost none, but thick. Ribs of two kinds; some are very large and prominent, others are much lower and shorter, but distinct even on the neck and on the stalk. Eye small, slightly raised, open; scales dark with pale margins, no iris. Color, dark violet chocolate, with a slight greenish flush in the shade, the swollen part of the neck close to the stalk being bluish-green. Apex dark violet brown, with here and there a flush of bright bluish green. Bloom thick, bluish white. Pulp very dark blood red, of exquisite flavor and sweetness, a perfect conserve: meat greenish yellow. Tree large, spreading; bark of tree dark, rough, not shiny; leaves large, 3 to 5 lobed, glossy, entire, but somewhat variable. Extensively cultivated near Roussillon, in France, and is there one of the latest figs. First crop very small, second crop larger; ripens from September to frost. One of the best figs, even superior to the white Col di Signora, but, like all figs, it thrives and comes to perfection only in certain localities. (Fig. 51.)

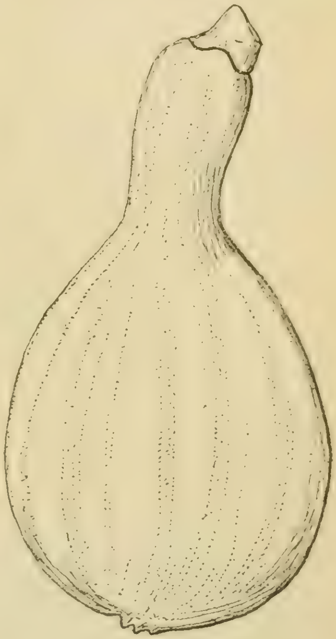


FIG. 51.—Col di Signora Nigra fig.

Col di Signora Panachée—*Col de Signora Bianca Panachée; Panachée; Striped Signora.*—Fruit above medium, shape roundish turbinate, even, regular in form, and very handsome in appearance. Neck shorter than the typical variety;

stalk about one-fourth inch long; color of skin, straw yellow, beautifully striped with longitudinal bands of bright, lively green, some of which are broad, others narrow. Eye closed, surrounded by a narrow iris; pulp bright rose, very sweet and delicious. This fig is similar in quality to the white Col, but with shorter neck and a distinct variegated skin and paler-colored pulp. It is not an extensively cultivated fig, on account of inferior bearing qualities, but for a garden fig it is much to be recommended, as it would sell well in any market. This fig is, however, inferior to the black Signora.

Colombro—Italy.

Comadre.—*Fico da Comadre.*—The best white-drying fig in Portugal, grown in Algarve, on the north shore of the Mediterranean.

Commercial Smyrna—Lob Ingir.

Common Blue—Brown Turkey.

Concordana.—Possibly identical with *Congourdane*—Mussega.

Constant Date—Datte Quotidienne.

Constantine—*De Constantine.*—From the Chiswick Garden, Royal Horticultural Society. Medium to small. Turbinate, 2 inches long by 1½ inches wide. Neck short and thin. Stalk very short. Many irregular ribs. Flat at apex. Eye small; open, with a brown iris. Color of skin, deep olive green, with violet ribs. Pulp dense, but with hollow center, of deep rose color. Tree straggling and spreading. Leaves medium, 3-lobed. (Fig. 52.)

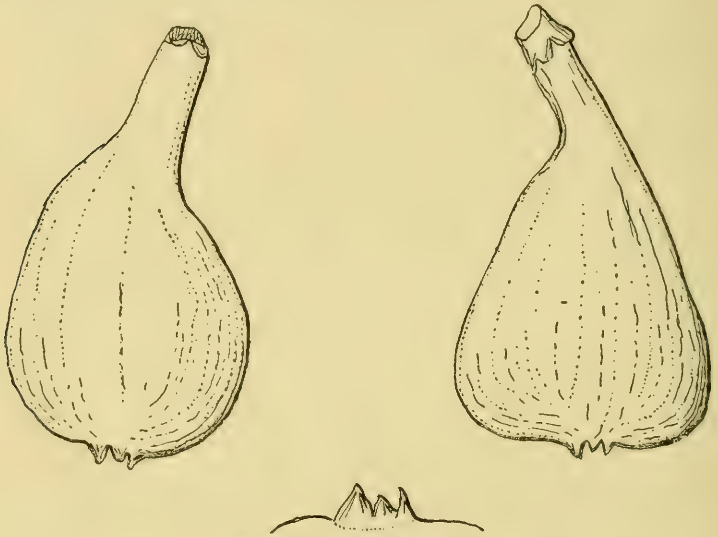


Fig. 52.—Constantine figs.

Corbo—San Pedro, Black.

Cordelia.—Large, about 2¼ inches long by 2 inches wide; pyriform, with the greatest diameter near the eye, where the fig is slightly flattened. Neck very short. Stalk short. Ribs coarse, but few, fading out towards the stalk. Eye very prominent, with large scales, all sunk below the cheeks. Skin yellowish, with green shade. Eye pinkish or yellow, with a darker zone around the seeds; variable. Meat and pulp amber. A large zone below the eye contains numerous male flowers of perfect development, with much pollen when ripe. The lower zone contains only mule or gall flowers. This fig was found in the San Francisco market in August, 1893, where it had been brought from Cordelia, Cal. Exact location unknown to the author. The fig is very juicy, sweet, and pulpy; but the male zone is, as usual, very dry. The fig is one of the sweeter kinds, but devoid of flavor. The characteristic male flowers of this fig place it close to the Croisic fig, as described by Professor Solms-Laubach.

Cordelière—Cotignana.

Cordellière—Servantine.

Cortese—Rolandina.

Cortice Crasso—Peloua.

Cotignana—*Observantine; Observantière Grise; Cordelière; Figue Grise; Ficus cotignana* Risso; *Ficus sylvestris* var. *praecox* Geny; *Blavette; Barbillanne.*—Two crops. Brebas above medium, 3 to 3½ inches by 2¼. Pyriform, flattened, and larger at apex, suddenly contracted at the base, with a long neck with prominent veins. Color gray, tinted lilac. Skin thick, but tender. Cracking eye, large, reddish, surrounded by a bluish iris. Pulp pale red and yellow, very sweet, and fine (June and July). These brebas are of the very best quality, and the highest-priced early fig in southern France. Second crop, in September and October, is very inferior in quality as fresh, but superior for drying. Size smaller, and of pale color. Leaves, 5-lobed. The tree requires moist, deep, and rich soil.

Cotignacenque.--About 2 inches long by 1 inch wide: oblong, with long neck, flattened at apex. Skin greenish white. Eye red. Pulp red. Leaves 3-lobed; lobes pointed. Requires dry soils, and is not affected by rain. A good fig, fresh and dry, and it dries well on the branches of the tree. Provence and Cotignac and other places in southern France. Not the same as *Cotignana*.

Coucouletta—Coucourela.

Coucourela—*Coucouletta; Coucourelle de Grasse; Ficus tournefortiana* Risso; *Ficus erinacea* var. *asperima* Geny.—Two crops. Second crop: Medium, 2½ inches long, oblong pyriform; skin thin; color greenish yellow, mixed with reddish; pulp red, sweet, with almost no seed. For drying almost as good as the Rolandina. Leaves very deeply lobed, the middle lobe being very long. Common around Grasse, in Provence, France.

Coucourele Brune—*Brown Coucourel; Coucourelle Brune* (Melette); *Ficus fusca* Risso; *Courcourellos Brunos* (Provence).—Two crops. First crop largest, 1½ by 1¾ inches; very early. Second crop: Small or medium, roundish; color of skin deep brown, with a thick blue bloom; stalk variable in size; pulp tender, without flavor, of deep red color, shading to rose. Except for want of flavor it is a rich fig. Requires dry soils. Common in Provence.

Coucourelle Brune—Coucourele Brune.

Coucourelle de Grasse—Coucourela.

Coucourelle Gavotte—*Coucourelle Noire; Black Coucourelle; Ficus labillardiera* Risso. Two crops. Medium to small, round, with dark longitudinal lines which are hardly elevated. No neck; eye open; skin deep purplish black over the apex and where fully exposed to sun, shading to paler, or even to greenish bronze in shade; blue bloom; pulp dark blood red, richly flavored. A first-rate fig.

Coucourelle Noire—Coucourelle Gavotte.

Cou de Muelo—Rose Noire.

Cougourdana—Mussega.

Cougourdane.—Aix and Saint Remi.

Cougourdane—Mussega.

Coull de Dama—Col di Signora Bianca.

Courcourelle Blanche—Angélique.

Courcourellos Brunos—Coucourele Brune.

Cravé.--Size medium to small, 2½ by 1⅓ inches; oblong; neck long; stalk short, tapering; skin rough, with close, distinct ribs; neck is bent; eye closed, elevated, with sunk scales; cheeks protruding; widest diameter just above the eye or near apex; color violet black, with gray bloom; pulp fine, deep violet red. A sweet, juicy fig, without flavor or aroma. Leaves large, broad, lopsided (deeply), the lobes spreading and serrated, 5-lobed, average diameter. Italy and France.

Crovère—Provence.

Cuers—*Des Dames; Verte; Trompe-Cassairè; Trompe-Chasseur* (Provence); *Cœur des Dames; Lady Heart; Cœur.*—About 1½ inches wide by 2 inches long; neck small, distinct; stalk long; eye prominent, elevated, open; ribs low; skin green, turning violet; pulp red; leaves 5-lobed, crenated, lobes pointed. Requires moist soils. One of the best figs of Provence. On account of its color this fig appears unripe when perfectly ripe, hence the name Trompe-Chasseur—hunters' deception. There is another fig known also in France as Trompe Chasseur on account of its deceptive color.

Cuore—Rubado.

D'Abondance—Franche Paillard.

Dalmatia—*Figue de Dalmatia* (Paul); *De Dalmatie.*—Very large, long, pyriform; skin pale green, covered with soft pubescence; flesh dull red, sweet and rich. (All according to Barron.) Is different from the fig known as "White Dalmatian" in California, which latter name was invented in this country, though the fig itself was introduced from Dalmatia.

Dalmatian—Ragusa.

Dalmatian Ragusaine—Ragusa.

Danina—Italy.

Date—Datte Quotidienne.

Date-Quotidienne—Datte Quotidienne.

Datte.—Medium or above; 2¾ inches long by 1¼ inches wide, generally lopsided, tapering. Neck distinct, slightly bent. Stalk very short. The longest diameter seldom passes through the eye. Skin waxy, smooth, with indistinct narrow ribs. Eye very small, closed with yellowish scales; skin very thin, pale green, with small oblong lighter dots. Pulp very fine, thick sirupy and rich, of a deep brownish salmon, perfectly solid. A most delicious, sweet fig. Tree medium; leaves small to medium, the larger ones about 7 inches long, with distinct lobes, the central one generally being the longest. This fig differs from DOTTATO and from DATTE QUOTIDIENNE. It is a much finer, though smaller, fig than the latter.

Datte Quotidienne—*Date; Dattes?; Figue Datte? Date-Quotidienne; Quotidienne; Constant Date.*—Medium to large, 2¼ inches long by 1¾ inches wide; pyriform; no neck, or one very short and thick. Stalk very short; a few shallow, longitudinal ribs; eye closed, depressed, small; skin smooth, except for the ribs. Color violet brown on the ribs and on the sunny side, otherwise changing to green, especially around the stalk end. A rich violet bloom around the stalk end, which ends in the equatorial line. Pulp thick, oily, dark brownish rose. Tree moderate grower. Leaves medium to large, 5 lobed. A very fine fig for drying, especially at Salon and Eyquières, France.

Dattaresi—DOTTATO.

Dattero—DOTTATO.

Dattes?—DATTE QUOTIDIENNE.

Dattrali—DOTTATO.

Dauphine—*Dauphine Violette; d'Argenteuil; Argenteuil; Grosse Violette.*—First crop: Very large; round turbinate; stalk very short; color of skin purple, with thick blue bloom; pulp amber. Second crop: Smaller; about 2 inches long by 1½ inches wide. Grown extensively around Argenteuil for the Paris market. The most successfully cultivated dark fig for out-of-door culture in northern latitudes. It keeps long and transports more readily to distant localities than almost any other fig. Tree strong grower; leaves small, 3-lobed.

Dauphine Violette—DAUPHINE.

Daurada—*Ficus lutea* Risso; *Ficus carica* var. *chrysocarpa* Geny.—Below medium, 1¼ to 1¾ inches long; globular, flattened at apex, color bright greenish yellow, pulp red. Savoy, around Nice. This fig differs from the *Figue d'or* or *Dorée* of Provence and also from the Italian Dorato, for which see Albo.

D'Abondance—FRANCHE POILLARD.

D'Argenteuil—BLANCHE.

D'Argenteuil—DAUPHINE.

D'Athènes—ATHÈNES.

De Bellegarde—BARNISSOTTE, BLACK.

De Constantine.—Small, about 1½ inches each way; turbinate; small, straight neck; very short stalk, distinct, regular, but few ribs from stalk to apex. Eye medium, closed, with large scales, violet-brown iris, not elevated; skin rugose, of a dingy green color, dingy violet on sunny side and near stalk end. Bloom distinct, confined to a narrow zone around the stalk and occupying about one-fourth of the fig. Pulp dingy salmon, fine grained, rich and high flavored. Leaves medium, about 7 inches, 3 to 5 lobed, glossy, with small spurs, crenate. The fig from which this description is taken was received from the Royal Horticultural Society of London through Rev. Dr. Wilkes. The fig differs from a variety received from English nurserymen under the same name, and which is referred to in another place as *Constantine.*

De Constantine—CONSTANTINE.

De Dalmatie—DALMATIA.

D'Espagne—ESPAGNOLA.

D'Eyrogue—EYROGUE.

De Grasse—MATARASSA.

De Gerusalem—JERUSALEM.

De l'Archipel—ARCHIPEL.

De la Frette—VIOLETTE DE LA FRETTE.

De la Madeleine—MADELEINE.

De la Madeleine—MAGDALEN.

Delamater's—ADRIATIC.

Del Giappono—HIRTA.

De Lipari—LIPARI.

Della Cava—NATALINO.

Della Goccia d'Oro—DOTTATO.

Della Toccia—Italy.

De Nibran—NIBRAN.

De Porto—PORTO.

De Saint Esprit.—First crop fresh; end of June. At Marseilles, Aix, and Salon.

De Saint Jean—BRUNSWICK.

De Saint Jean—SAINT JEAN.

Des Dames—CUERS.

Di Gerusaleme—JERUSALEM.

Doctor Hogg Black.—Medium; oblong, obovate; neck very short or wanting; stalk very short and thick; eye small, closed; skin slightly hairy and of dark mulberry color, covered with thick blue bloom and numerous little white specks on the surface, which is furrowed by longitudinal lines. Pulp dull red, thick, and sirupy, very richly flavored. First found by Dr. Hogg near Toulouse, in France. The native name is not known. (Hogg.)

Doctor Hogg's Clare—CLARE.

Doctor Kimball's White—GENTILE.

Domestica—*Figa domestica* (Provence); *Ficus sylvestris* var. *tragus* Geny.—Pyriform; greenish yellow, pulp bright red. Nice and Provence.

Dominique—*Saint Dominique.*—A violet-colored French fig.

D'Or Bifère.—Small, or below medium, long ovate; color dull brown and greenish yellow; flesh blood red; very rich and juicy. (Barron.)

D'Or de Beaum.—Medium; oblong; distinct ribs; stalk short, very stout; eye open; skin pale hazel brown, on shaded side green, yellowish at full maturity. Pulp rosy toward eye, opaline toward stalk end; quality good or excellent. (Hogg.)

D'Or de Laura.—Below medium; oblong, with obscure ribs; eye closed; skin green, turning yellowish or dirty white when fully ripe. Pulp opaline, very sweet and tender. An excellent fig.

Dorée—*Figue d'Or.*—Two crops. Medium; oblong; color bright yellow; pulp salmon rose. The first crop is inferior, but very abundant. Fruit very large, irregular, clear yellowish brown. Second crop: Medium or below medium; turbinate, with flattened apex; about 2 inches long by 1¾ inches wide. Ribs many, narrow, and shallow, but still distinct. Neck tapering from near the apex. Stalk very short. Color of skin pale, yellowish green, with fine gray bloom extending down to the widest part of the fig. Color very transparent and waxy. Not shining, but slightly downy. Eye small, depressed, open, with large scales. Pulp clear amber, with rosy flush, and large seeds. Meat greenish white. A fine, juicy fig of good quality. Small, but handsome. Tree moderately large, erect. Leaves small, 3-lobed.

Dorée Nobis—(spelling doubtful); *Dorée Norbus* (spelling doubtful.)—Fruit medium or above about 2 inches long by 1¾ wide; pyriform, the widest part above the eye. Ribs many, close, and shallow. No distinct neck, but with slight shoulders at the stalk, which latter is short. Skin waxy and beautifully transparent, of a light greenish-yellow color, more green around the apex. Eye small, closed frequently, with large raised iris. Pulp clear amber white; very fine grain. Meat thick; white. Seed small. Center often hollow. Tree strong, erect, with leaves large, drooping, with shallow 3 to 5 lobes. A very handsome fig, of good quality. Does not belong to the Marseillaise class. This fig is very similar to Dorée, but differs slightly in the color of the pulp. (Fig. 53.)

Dorée Norbus—DORÉE NOBIS.

Dottati—DOTTATO.

Dottato—*Calabria; Dattaresi; Dattero; Dottati* (Sargana); *Binellino* (Spezia and Chiavari); *Binelli* and *Fichi di Napoli* (at Genoa); *Gentile; Gentili* (at Voltri); *Napolitani* (at Finali); *Fichi de Calabria* and *Dattrali* (in western Liguria); *Gentile di Napoli* (Novi in Appennino, Liguria); *Goccia; Fico Della Goccia* and *Della Goccia d'Oro* (in Lombardy).—Size medium or above medium, 2½ by 3 inches or less. Shape ovate, pyriform, with the greatest diameter through the center. Neck medium, very well set and shouldered (especially in the first crop). Stalk very short or none; ribs low; skin smooth when fully ripe; shaded ribs; eye medium, closed or semiopen; scales small, pink colored. Skin thin, bursting, yellowish green amber, sometimes with violet flush. First crop very few figs, 1 or 2 dozen to the tree. Second crop abundant; leaves broad, round, 3 lobed. Tree a heavy grower and fine bearer. One of the very best figs, suitable for drying. The Dottato is the best-known fig in Toscana, and from there extends to southern Italy, and is the most valuable fig for drying there. The largest part of Italian exported dried figs is of this variety, and better than the Bourgasotte. The Dottato loves rich and moist soils and is not suitable for dry lands. Gallesio supposes the Dottato to be identical with the Smyrna varieties, which is a mistake; neither is it identical with the Datte as grown around Salon and Eyrique, in Provence. This latter fig has a dark, rosy pulp, but is otherwise similar to the Dottato, and is probably a variety of that Italian fig. What the Dottato is for Toscana. Verdone is for Rome. Trojano for Naples, and Marseillaise for Provence. (Fig. 54.)

Doucette, White.—Good, fresh, and dry. France, at Salon.

Doukkar.—The general name of the caprifig in Kabylia.

Douqueira Blanca—*White Douqueira; Ficus carica* var. *goupiliana* Geny.—First crop: Large, 3¼ to 4 inches long by 1¾ to 2 inches wide. Shape oblong, pyriform: very slender neck: skin thick, slightly downy, with prominent ridges, adhering to the pulp, which is lively red; color of skin yellowish white. Second crop: Smaller, 2¼ by 1⅜ inches. Skin rough, eye large, red. A very good fig.

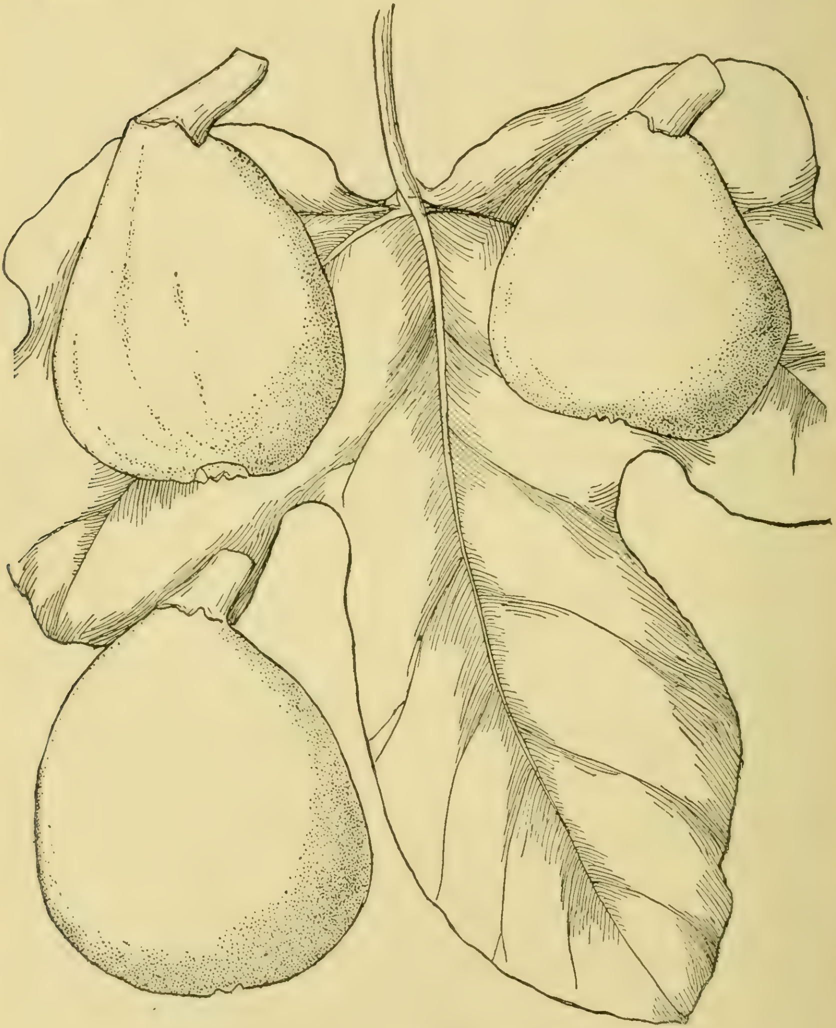


FIG. 53.—Dorée Nobis figs.

Douqueira Negra—*Arguscla; Peroquina; Monginence* (Grasse); *Perruquier; Ficus nicœensis* Risso; *Ficus erin.* var. *fertilis* Geny.—Two crops. First crop very large, 3¼ to 4 inches long by 4¾ to 2 inches wide. Oblong, pyriform, with a thin neck. Skin thick, slightly downy, with prominent ribs, adhering to the pulp. Color blackish violet. Pulp lively red, sweet, and agreeable. Second crop much smaller, not good as fresh, but excellent dried. A fig valuable for its first crop or brebas. Extensively cultivated near Nice, in France, where it originated and where it becomes characteristic of the district.

Douro, Black—*Black Douro.*—Size medium or below medium, pyriform or onion-like, about 1⅝ inches in both diameters. Stalk very short: neck very narrow and short, well set, but bent. Numerous narrow ribs, especially distinct on the cheeks. Apex flat; eye open, rather large: scales small, upright. Color dark blue, with a fine and dense gray bloom that can not be rubbed off: pulp medium fine, very pale rose, shading to amber, very sweet, but not highly flavored. Tree a moderate grower with close head; leaves medium to large; about 8 inches diameter, rounded, almost entire. Under side very coarse. (Figs. 55, 56.)

Douro—*Large Black Douro.*—First crop: Very large, about 4 inches long by 2¼ wide. Ovoid, with short neck, gradually tapering. Stalk very short. Skin smooth, with thin down. Ribs numerous, very shallow. Color brown, mottled violet, with green on the neck. Eye small, with small scales of a rosy brown color. Leaves medium, broad, 5-lobed, with somewhat serrated edges. Leaves pointed, with pointed lobes, with sinuses of medium depth. Pulp rosy, brownish red, surrounded by a thick zone of violet flesh of a dark shade. A very superior breba of fine appearance and attractive quality. One of the largest of all figs. Brebas ripe at Niles August 1. (See Portugal, Black.)

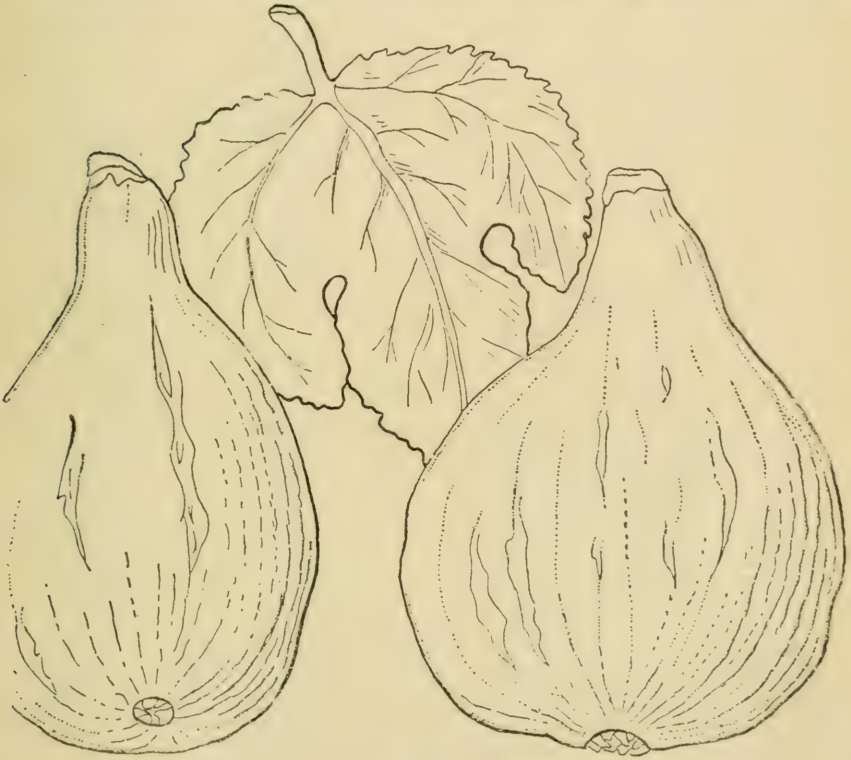


FIG. 54.—Dottato figs.

Douro Vebra.—Size small, 1½ inches long by 1¼ wide: pyriform, tapering, with a short, straight neck; a few ribs near the neck, none on cheeks. Stalk medium to short, one-third the length of the fig; eye prominent, but closed: scales prominent; no iris; skin rather waxy, with faint bloom: color dark violet black, with a little greenish shading around the stalk. Pulp amber, brownish, with a rosy margin; meat white; pulp dense and fine; seeds small. A fair fig, but not highly flavored, at Niles. Tree strong, with a dense head. Leaves variable, large to small, 3 to 5 lobed, with shallow lobes about 5 inches wide by 5½ to 6 long; glossy; lopsided.

Drap d'Or.—Large, 3½ inches long by 1½ inches wide: pyriform, with very long and distinct neck and a long stalk. Ribs elevated, distinct, waxy, but few in number; apex obtuse and concave at the eye, which is sunk between swollen cheeks. Eye small, with distinct violet iris; scales rosy amber. Color of skin light violet to reddish amber, not very dark. Ribs darker; between them the color shades to reddish yellow. The side exposed to the light only slightly darker; neck is of the same color, but the stalk is bright yellowish green. Bloom thin and pale; pulp rosy red; meat yellow amber, of very fine quality; regarded by the French confectioners as one of the best figs for crystallized and glacé fruit. Hogg gives as synonym Brunswick, which is erroneous, this being a different fig. (Fig. 57.)

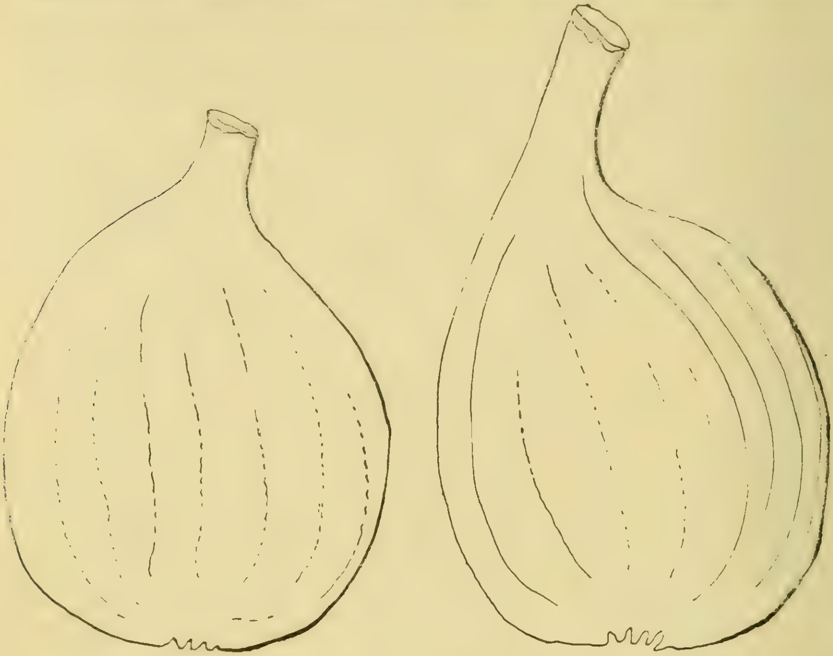


FIG. 55.—Douro, Black figs.

Drap d'Or (Barron).—Below medium; almost round; no neck; skin pale greenish yellow shaded with brown; flesh delicate amber, thick juicy, and well flavored. This description given by Barron indicates a very different fig from the preceding, which the author believes is the true Drap d'Or.

Du Japon—HIRTA.

Du Roi—*Du Roy*.—Size above medium, 2¼ by 1¾ inches; larger than the Marseillaise. Shape rounded, pyriform, uneven, with swollen cheeks. Ribs few, slightly elevated and irregular in outline. Neck distinct, always short, but variable; stalk very short. Eye large to very large, without elevated iris;

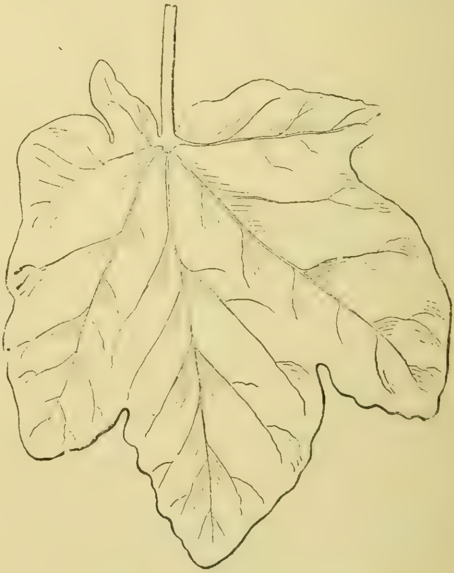


FIG. 56.—Leaf of Douro, Black fig.

scales large, standing out, of a pale amber color. Skin smooth, but not waxy, of a pale bluish-green with a darker green on the exposed side. Pulp amber, with rosy streaks and with many exceedingly minute seeds, and of a fine texture. This fig does not belong to the Marseillaise class. It has smaller seeds and a finer meat and pulp, and is also more oblong than that fig. It is a most excellent fig and one of the very best figs grown in California. Is suitable for drying as well as fresh. In some localities it is preferable to the Marseillaise. This fig can not be too highly recommended and will no doubt become one of the most extensively grown figs in California and Arizona. (Fig. 58.)

Du Roy—Du Roi.

Early Howick—Brown Turkey.

Early Violet.—Very small to small. Round, turbinate, with swollen and protruding cheeks; neck distinct, but short; stalk medium to long; ribs distinct, somewhat elevated, sometimes much elevated. Eye large, sunk, closed; scales large, rosy red, with small iris. Skin rough and uneven, violet brown with red flush and a thin peach-colored bloom, which does not quite reach the eye. Pulp red, fine, and sweet. This fig, though small, bears continuously and is valuable on that account. Preferable to the Ischias and Celeste. (Fig. 59.)

Early White—*Early Yellow; Small Early White; Jaune Hâtive.*—Small, roundish turbinate, somewhat flattened at apex; color of skin pale yellowish white, very thin skin; pulp white, sweet, but wanting flavor.

Early Yellow—Early White.

Ecousse Noire.—Probably the same as Recousse noire.

El-hadj.—A black fig from Kabylia which requires caprification.

Endrich.—Two crops; medium size, oblate or pyriform; neck very long; stalk short; ribs shallow; eye very large, open; skin greenish-yellow, no bloom, quite thick; pulp of first crop dingy opaline in center, surrounded by a broad band of muddy but distinctly violet pulp, rather coarse, but sweet. Second crop has the pulp white, with occasionally a trace of violet around the margin. In drying the pulp turns violet-black. Tree is of medium size, leaves woolly, lobes shallow and rounded. Introduced from Italy by W. B. West, but sold to Mr. Endrich, of Stockton, Cal., who lost the original name. Again propagated, and distributed by Mr. W. B. West and others under the name of Endrich. Generally a poor fig, but said in some localities to be very excellent; especially so around Stockton, according to Mr. West. Farther inland, in the San Joaquin Valley, this fig is very poor and almost worthless. Some trees sent out under this name are identical with Rubado.

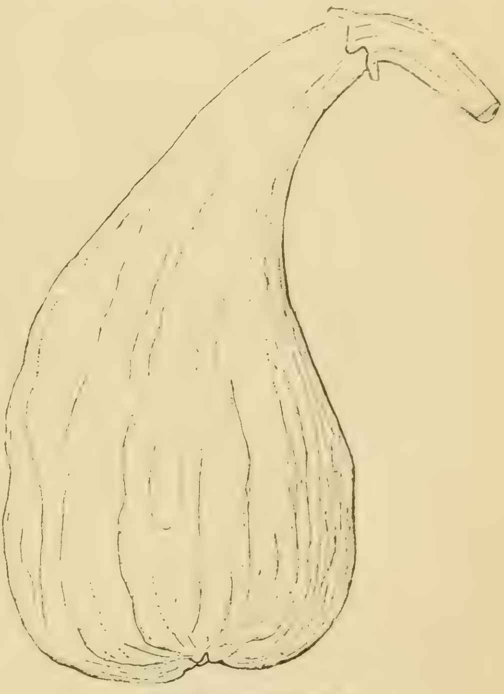


Fig. 57.—Drap d'Or fig.

Erbeili—Lob Ingir.

Erbeghli—Lob Ingir.

Erbelli—Lob Ingir.

Espagnola—*D'Espagne.*—White. Late. Aix, France.

Esquilarello—Lipari.

Euscaire Preto.

Eyrogue—*D'Eyrogue.*—Below medium, oblate; skin pale; yellow, tinted green. Pulp pale rose, juicy, but not rich. France.

Fabre.—Two crops. Large. France.

Fallagiana—SAN PEDRO, BLACK.
Fichi de Calabria—DOTTATO.
Fichi di Napoli—DOTTATO.
Fichi Dori—GENTILE.
Fichi d' Oro—ALBO.
Fico Arbicone—SAN PEDRO, BLACK.

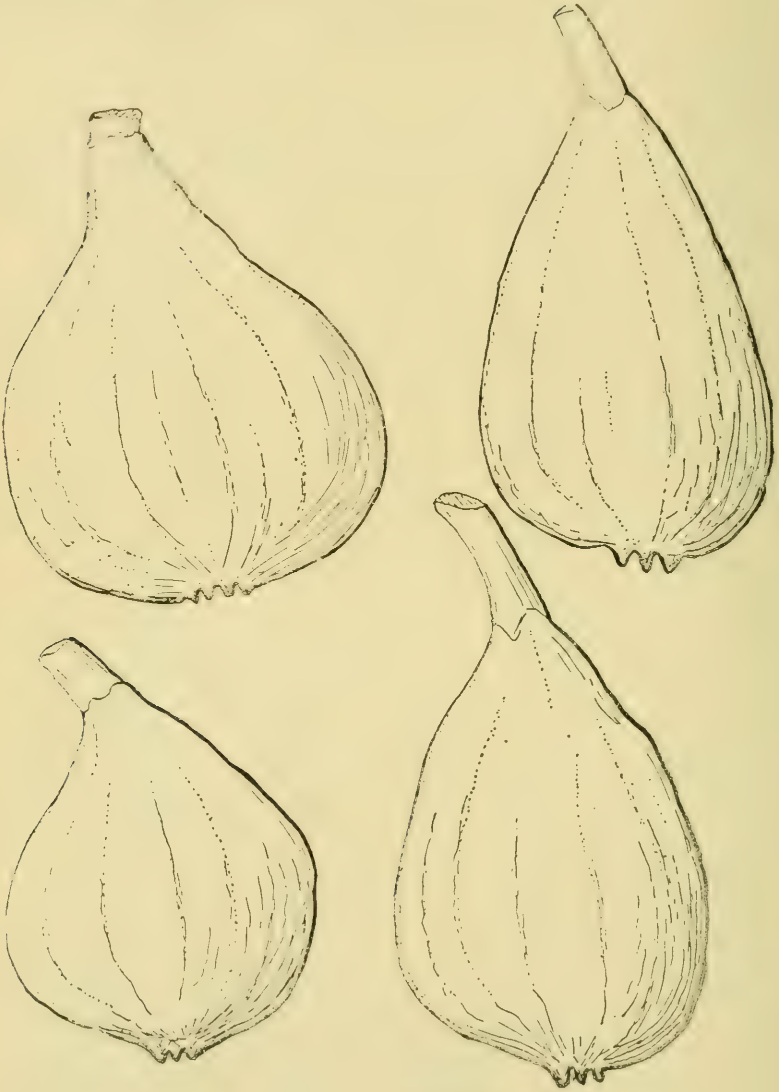


FIG. 58.—Du Roi figs.

Fico da Comadre—COMADRE.
Fico dall' Osso—MERIOUN.
Fico Dattero—ROLANDINA.
Fico della Goccia—DOTTATO.
Fico di Fragola—ADRIATIC.
Fico Dorato—ALBO.
Fico d' Oro—GENTILE.

Fico di Saint Piero—San Pedro, White.
Fico di San Piero or Saint Piero—San Pedro, White.
Fico di San Pietro—San Pedro, White.
Fico de Saint Piere—San Pedro, White.

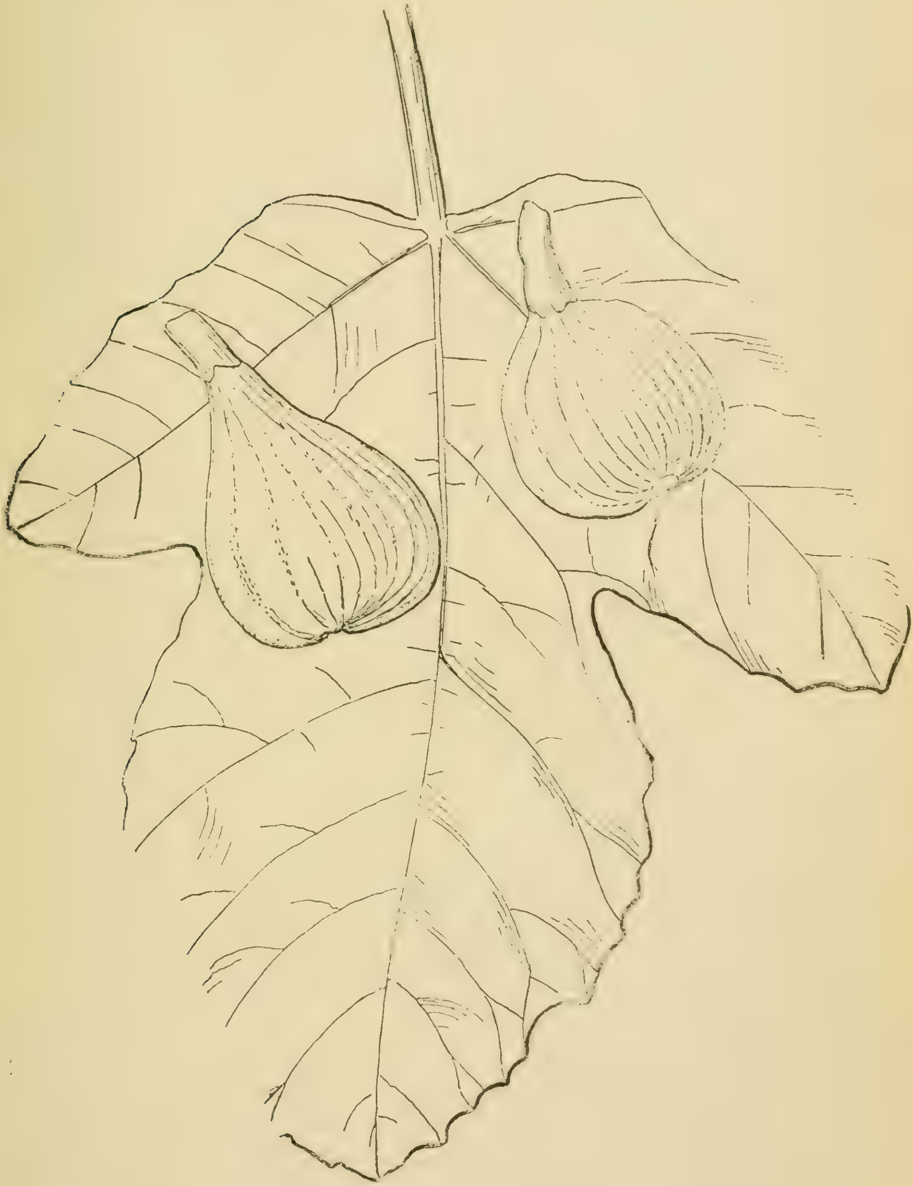


Fig. 59.—Early Violet figs

Fico di Spagna—Franciscana.
Fico fetifero—Merioun.
Fico Nero—San Pedro, Black.
Fico ovata—Caravanchina Negra.
Fico San Piero—San Pedro, Black.

Fico unico—Franciscana.
Fico violacea—San Pedro, Black.
Fico zentil—Albo.
Ficus acuta—Pounchuda.
Ficus albida—Blancassa.
Ficus amara—Amarouna.
Ficus barnissote—Barnissotte, Black.
Ficus bovina—Bouin.
Ficus browni—Caiana.
Ficus caiana—Caiana.
Ficus candoleana—Caiana blanca.
Ficus carica var. *carmosa*—Col di Signora Bianca.
Ficus carica var. *chrysocarpa*—Daurada.
Ficus carica var. *deceptans* Geny—Verte Brune.
Ficus carica var. *flomantiana*—Cabroliana.
Ficus carica var. *florentina*—Toscana.
Ficus carica var. *fodereana*—Blancassa.
Ficus carica var. *formosa*—Sucrada.
Ficus carica var. *fucosa*—Castagnola.
Ficus carica var. *goupiliana*—Douqueira blanca.
Ficus carica var. *leiocarpa*—Seirola.
Ficus carica var. *ligurica*—Pissalutto Bianco.
Ficus carica var. *lunata*—Princessa.
Ficus carica var. *luteus*—Albo.
Ficus carica var. *multiferox*—Verdal, Long.
Ficus carica var. *prolifera*—Tapa Cartin.
Ficus carica var. *robusta*—Rubado.
Ficus carica var. *rotundula*—Rondeletta.
Ficus carica var. *serotina*—Grosse Beurdoua.
Ficus cemenelea—Cimeirenca.
Ficus clavicularis—Claveu.
Ficus collina—Caravanchina.
Ficus cotignana—Cotignana.
Ficus domina—Col di Signora Bianca.
Ficus dulcissima—Briasca Doussa.
Ficus dylo var. *amarula*—Amarouna.
Ficus erinocea var. *asperima*—Coucourela.
Ficus erinocea var. *cemenelea*—Cimeirenca.
Ficus erinocea var. *cinerescens*—Bordeaux.
Ficus erinocea var. *eriocarpa*—Peloua.
Ficus erinocea var. *erodens*—Saraina.
Ficus erinocea var. *fertilis*—Douqueira Negra.
Ficus erinocea var. *fœtifera*—Merioun.
Ficus erinocea var. *gemina*—Merlinga.
Ficus erinocea var. *jucunda*—Barnissotte, Black.
Ficus erinocea var. *longicaulis*—Claveu.
Ficus erinocea var. *melongena*—Merengiana.
Ficus erinocea var. *mentonensis*—Mentonasca.
Ficus erinocea var. *salsula*—Mouissouna.
Ficus erinocea var. *saxetana*—Negretta.
Ficus erinocea var. *uberrima*—San Pedro, Black.
Ficus franciscana—Franciscana.
Ficus fusca—Coucourele Brune.
Ficus gallica—Catalan.
Ficus garideli—Bernissenca.
Ficus grandis—Barnissotte, White.
Ficus grassensis—Matarassa.
Ficus helena—Rondella Blanca.
Ficus hirta—Hirta.
Ficus imperialis—Imperial.
Ficus labillardiera—Coucourelle Gavotte.
Ficus linneana—Mussega.
Ficus longicaudata—Peconjudo.
Ficus lutea—Daurada.
Ficus marsiliensis—Athènes.
Ficus meirana—Meirana.
Ficus melitensis—Merengiana.
Ficus mellifera—Meou.

Ficus monstruosa—Tapa Cartin.
Ficus mouissona—Mouissouna.
Ficus mourenao—Mourenao.
Ficus nicaœensis—Douqueira Negra.
Ficus nigra—Negretta.
Ficus nucleata—Merioun.
Ficus obovata—Caravanchina Negra.
Ficus phoceana—Marseillaise, Black.
Ficus pilosa—Peloua.
Ficus polymorpha var. *depressa*—Barnissotte, Black.
Ficus polymorpha var. *hematocarpa*—Franciscana.
Ficus pulchella—Gentile.
Ficus punctulata—Mussega Negra.
Ficus purpureo-violacea—Salada.
Ficus radiata—Princessa.
Ficus richardi—Rubado.
Ficus richeta—Ome.
Ficus rolandina—Rolandina.
Ficus rosa nigra—Rolandina Negra.
Ficus saccharata—Sucrada.
Ficus saffrenia—Pissalutto Negro.
Ficus saracenica—Saraïna.
Ficus seirola—Seirola.
Ficus serotina—Rubado Negro.
Ficus siciliana—Siciliana.
Ficus smithii—Levenssana.
Ficus sylvestris var. *africana*—Caiana.
Ficus sylvestris var. *alpestris*—Levenssana.
Ficus sylvestris var. *bruttia*—Siciliana.
Ficus sylvestris var. *calabra*—Calabresa.
Ficus sylvestris var. *ceresana*—Rondella Negra.
Ficus sylvestris var. *festinatissima*—Briasca.
Ficus sylvestris var. *hyberna*—Rubado Negro.
Ficus sylvestris var. *mauritanica*—Moresca.
Ficus sylvestris var. *monstruosa*—Fourrassa.
Ficus sylvestris var. *obovalis*—Caravanchina Negra.
Ficus sylvestris var. *olivula*—Mourenao.
Ficus sylvestris var. *praecox*—Cotignana.
Ficus sylvestris var. *praedulcis*—Rolandina.
Ficus sylvestris var. *praelonga*—Pounchuda.
Ficus sylvestris var. *rubella*—Roussana.
Ficus sylvestris var. *rubricaulis*—Rolandina Negra.
Ficus sylvestris var. *rufescens*—Negrau.
Ficus sylvestris var. *smyrna*—Meou.
Ficus sylvestris var. *sublittoralis*—Caravanchina.
Ficus sylvestris var. *tragus*—Domestica.
Ficus sylvestris var. *turgenia*—Franciscana.
Ficus sylvestris var. *ventricosa*—Matelassa.
Ficus tournefortiana—Coucourela.
Ficus variabilis—Verdal, White.
Ficus vezzoso—Rolandina.
Ficus virescens—Verdal, Long.
Figa a Merioun—Merioun.
Figa Bovin—Bouin.
Figa clou—Claveu.
Figa de Meou—Meou.
Figa d'Ome—Ome.
Figa domestica—Domestica.
Figa florentina—Toscana.
Figa fourrassa—Fourrassa.
Figa maravilla—Princessa.
Figa mielleuse—Meou.
Figa negrau—Negrau.
Figa princessa—Princessa.
Figa rubado—Franciscana.
Figa rubado—Rubado.
Figa siciliana—Siciliana.

Figa turca—PRINCESSA.
Figa verdara—CIMEIRENCA.
Figo melograno—FRANCISCANA.
Figue d'Athènes—ATHÈNES.
Figue de Dalmatia—DALMATIA.
Figue datte(?)—DATTE QUOTIDIENNE.
Figue de Grasse—MATARASSA.
Figue de Mentone—MENTONASCA.
Figue Mielleuse—MEOU.
Figue de Naples—MARSEILLAISE, WHITE.
Figue d'Or—DORÉE.
Figue franciscain—FRANCISCANA.

Figue d'Or.—It is doubtful if this is a synonym of Brunswick, as stated by several continental writers. Students of hothouse figs are too ready to lump figs, received under different names, together as synonyms, relying principally upon resemblances of the first crop, the second crop seldom maturing under glass, or at least not maturing to perfection. Thus it has come to pass that many of the synonyms given by Dr. Hogg are in reality distinct figs, but which show only their true characteristics when growing in suitable localities out of doors and in climates favorable to the full development of the figs.

Figue Grise—BEAUCAIRE.
Figue Grise—COTIGNANA.
Figue Grise—MATARASSA.
Figue Poire—BORDEAUX.
Figue Poire—SAN PEDRO, BLACK.
Figue Reine—MUSSEGA.
Figue violette—MOUISSOUNA.
Figuier Rouge—VIOLETTE DE LA FRETTE.
Fiquo Aubiquon—BORDEAUX.
Florentina—TOSCANA.
Fleur Rouge—BROWN TURKEY.
Flomantiana—CABROLIANA.

Ford—*Ford Seedling.*—Large or above medium: shape, turbinate-pyriform, rather uneven, with swollen cheeks, hanging and protruding above the eye. Neck very short, but distinct, like a stalk; stalk none; ribs not elevated, but colored darker; eye open, medium size, sunk below the cheeks, but slightly elevated at the scales; scales, many in the row (9 or 10), irregular, red; skin, smooth, dark, violet in sun, greenish in shade, sometimes greenish with violet flesh. Light-gray bloom; pulp rosy red, coarse; meat, rosy white. A very large fig, heavy crops and strong growth, coarse quality. The above fig is a different fig from the fig described under that name by Dr. Hogg, who regards it identical with Marseillaise. (Figs. 60, 61.)

Ford Seedling—FORD.

Fourrassa—*Figa fourrassa* (Nice); *Ficus sylvestris* var. *monstruosa*, Geny.—Second crop very large, 4¾ by 3½ inches; oblong, rounded at apex; skin thick, of a gray or greenish-yellow color, marked with small dots; pulp, red, juicy; medium quality. One of the largest figs, but of doubtful value. Nice and its vicinity.

Franche Paillard—*Abondance; D'Abondance; Franque Pagarde.*—Two crops. First crop: Medium, oblong; skin light brown; pulp salmon-red. Second crop: Medium, pear-shaped, violet-brown color, green in shade; pulp red, vinous, and juicy, but not always sweet. An enormous bearer, of value only in few favored localities in France, where it is extensively cultivated, or at least distributed.

Franciscan—FRANCISCANA.

Franciscana—*San Francé; Franciscan; Figue franciscain; Figo melograno* (Italy); *Fico unico* (Port Maurice); *Fico di Spagna; Figa rubado* (western Riviera); *Ficus franciscana* Risso; *Ficus sylvestris* var. *turgenia* Geny; *Ficus polymorpha* var. *hematocarpa* Gasparrini; *St. Francis.*—One crop; medium; 2 to 2½ inches diameter, turbinate, flattened at apex; skin cracking; color bright greenish-violet; pulp juicy, honey like, blood-red or of the color of the red pomegranate. A fig good for drying, but it cracks and splits wide open like a flower after having been exposed to a rain storm. Not uncommon in the Riviera around Nice, France.

Franque Pagarde—FRANCHE PAILLARD.
Frette—ROUGE DE LA FRETTE.

Genoa, Black—*Negro d'España, Noire d'Espagne, Nigra; Black Spanish.*—Large, oblong, broad toward the apex, very slender toward the stalk; skin dark purple. almost black, with a thick blue bloom; pulp yellowish nearly to the meat, reddish or red toward center; juicy, sweet, and rich. Said by Hogg to be the most common black fig in Languedoc and Provence. This is not now the case.

Genoa, White—*White Genoa.*—Size above medium, 2¼ by 1½ inches; shape pyriform; neck small, not set off; stalk very short; ribs very shallow, merely elevated lines. Skin downy; eye very small, not elevated, open, pale pink-amber. Skin pale olive-green with yellow cheek, drawing to pale yellow-amber, mottled with russet around the eye; color of neck the same. Pulp varying from amber to pale rose and darker red; under the skin pale greenish-white. Tree a strong grower, with open head; branches brittle, breaking readily; leaves very large, deep green, 5-lobed. One of the best figs, entirely distinct from the Marseillaise, which is given as a synonym by Dr. Hogg—not even belonging to the same class. It is undoubtedly one of the best figs grown in California. The identity of this fig is, however, not fully established, and it may be possible that it is identical with some of the many Italian figs not yet introduced to this country or even adequately described. The origin of the name under which this fig came to California is not known. (Fig. 62.)

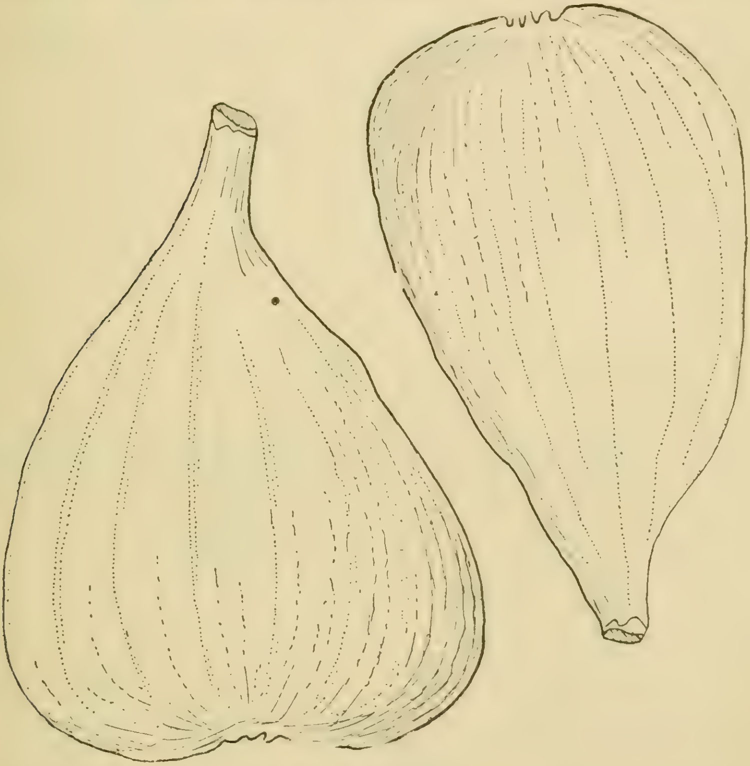


FIG. 60.—Ford figs.

Gentile—*Tiburtina*, Pliny; *Gentile sub-lutei; Gentile Bianchi; Fichi Dori; Fico D'Oro; La Gentile; Ficus pulchella*, Risso; *Dr. Kimball's White* (Haywards, Cal.).—First crop: Very large, 2¼ by 3 inches; shape ovate-pyriform, widest below the center; neck swollen, very distinct, well set, but not long; stalk very short; skin uneven, with ridges, which become less at perfect maturity; skin adheres to pulp; eye very large, open, with the scales protruding. Color green, shaded to canary or yellow, spotted white, darker green in the shade. Pulp amber, translucent, very sweet and highly flavored, streaked with rose; seed few, but very large. Leaves 3-lobed, very large, of dark-green color similar to that of Brogiotto-Genovese and Sanguinello Pisa. Large tree with the lower branches very long and weeping; the upper branches tall and upright; a very pretty growth. Only the first crop ripens well. Second crop, when it is partially mature, is of rounder form, but always drops. One of the very best Italian figs, and especially valued as a table fig. Extensively grown from Naples to Toscana and Riviera, but does well also farther north. The Gentile (pronounced genteele) is one of the most luscious, pulpy, and

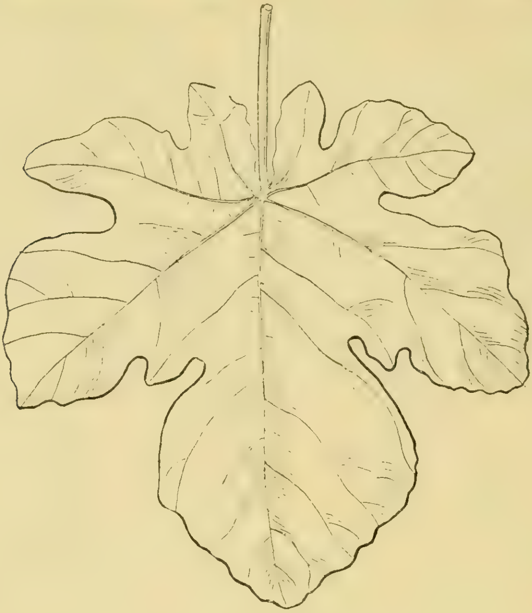


FIG. 61.—Leaf of Ford fig.

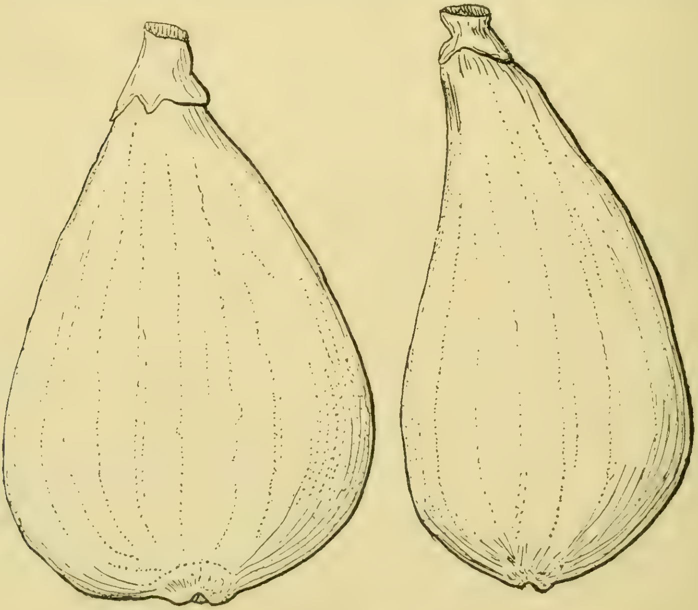


FIG. 62.—Genoa, White figs.

highly flavored of all figs, and should be generally cultivated. It grows best in deep, rich bottom lands with moist ground, and does not take well to dry hills. So far only a few figs of this variety are grown in California. The oldest tree in the State is found on Dr. Kimball's place, near Haywards (Alameda County). Other trees, now 8 years old, are grown at Knights Ferry. The second crop drôps there, as it does in Italy and elsewhere. The climate of Knights Ferry is very warm and dry, while that of Niles and Haywards is moist and comparatively cool. It was supposed for years that all that this fig required was a warm and dry air in order to ripen the second crop. But its failure to do so, even in the hottest place, satisfies the author that it belongs to the San Pedro class, which requires caprification for the second crop, the flowers of which are apparently perfect female flowers. It appears that in Italy several figs are known as Gentile, but the one described above is the true Gentile, and no other varieties should bear that name. (Figs. 63, 64, 65.)

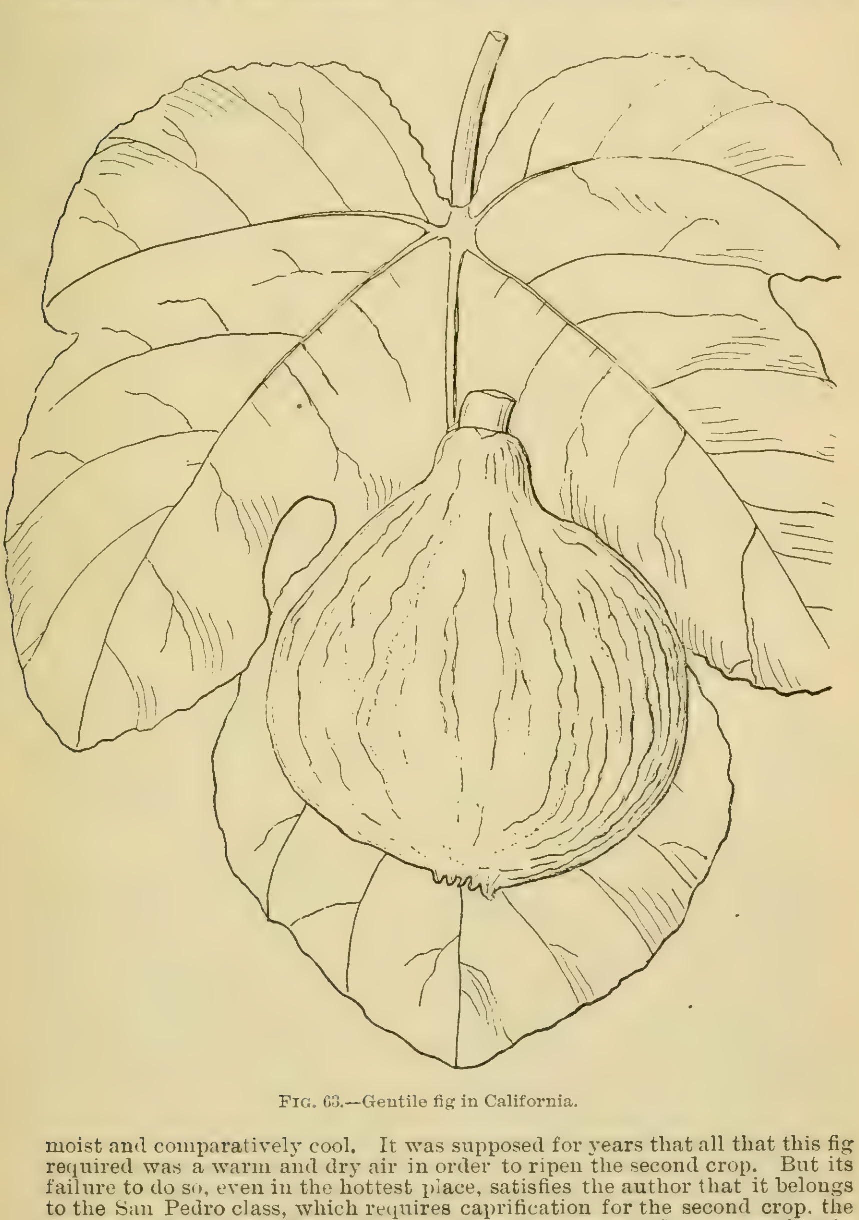


FIG. 63.—Gentile fig in California.

Gentile—DOTTATO.

Gentile (Bologna)—ALBO.

Gentile di Napoli—DOTTATO.

Gentile sub-lutei—GENTILE.

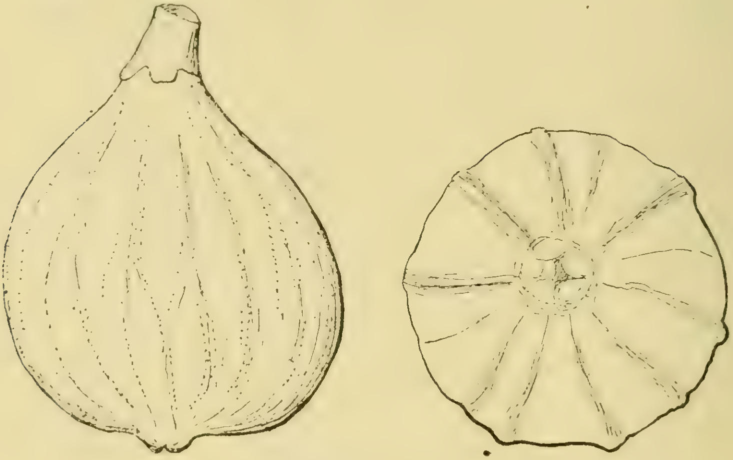


FIG. 64.—Gentile fig in California, unripe.

Gentile Bianchi—GENTILE.

Gentili—DOTTATO.

Gentilla Roussa—MORESCA.

Giallo Rotondo.—Italy. Probably identical with some other variety.

Giallo Verde.—Italy.

Gironetta—VERDAL, LONG.

Goccia—DOTTATO.

Gombaya.—Medium, rounded; bright rose; stem of tree blackish; requires moist soils. A fig of value grown in the vicinity of Valencia, Spain, where it is much esteemed.

Gouraud Noire — *Gourreau noire; Gourreau du Languedoc; Bourdou; Bourraillese; Maris No. 2.*—Two crops. First crop: Large, pyriform, oblong, skin very bright violet black, passing to vinous red toward the stem, cracking when ripe; pulp red, very good. Second crop: Medium, pyriform, oblong, skin dark violet purple; pulp red, sweet, but dry. A very vigorous-growing tree, and a good fig to recommend.

Gouraud Rouge.—Medium, pyriform, rounded, with flattened apex about 1¾ inches long by 2 inches wide. No neck and very short stalk; eye small but rough and open, depressions around the iris; scales dark violet; ribs many, narrow, and shallow: skin rough, dull yellowish red to reddish violet, not at all handsome, but with a violet pale bloom. Pulp reddish brown, hollow center, juicy and firm and flavored. Leaves very small, 4½ inches long by 4 inches wide, almost entire, with 3 to 5 very shallow lobes.

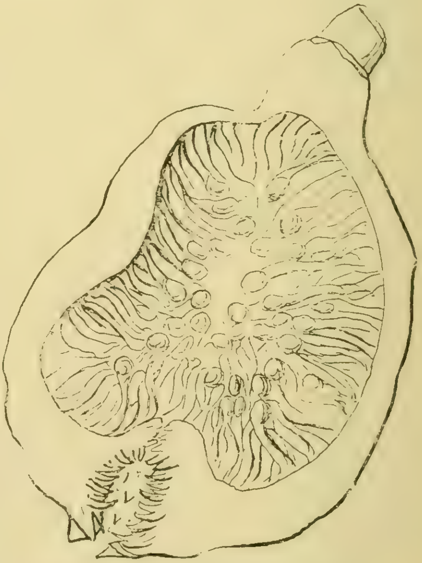


FIG. 65.—Gentile fig, cross section.

Gourreau du Languedoc—GOURAUD NOIRE.

Gourreau Noire—GOURAUD NOIRE.

Graissane.—Round, flattened, color white, taste poor. Provence.

Grassale.—From the Garden of the Royal Horticultural Society at Chiswick. Small, about 1¼ inches long by 1 inch wide, turbinate. Neck short and slender; stalk short; ribs indistinct; eye very small, open: skin waxy, yellow: pulp pale violet amber, finely grained: meat white: tree moderate, spreading: leaves medium to small, 5-lobed and rounded. It is doubtful if this tree is the true Grassale. I take the one described under Matarassa as the true variety of this name.

Grassale—MATARASSA.
Grasse—MATARASSA.
Grassenque—MATARASSA.
Gray Servantine—SERVANTINE GRISE.
Gray Fig—BEAUCAIRE.
Green Ischia—ISCHIA, WHITE.
Grise Servantine Bifère—SERVANTINE BIFÈRE.
Grisette—BEAUCAIRE.
Grisette Hâtive—BEAUCAIRE.

Grosse Banoie.—France.

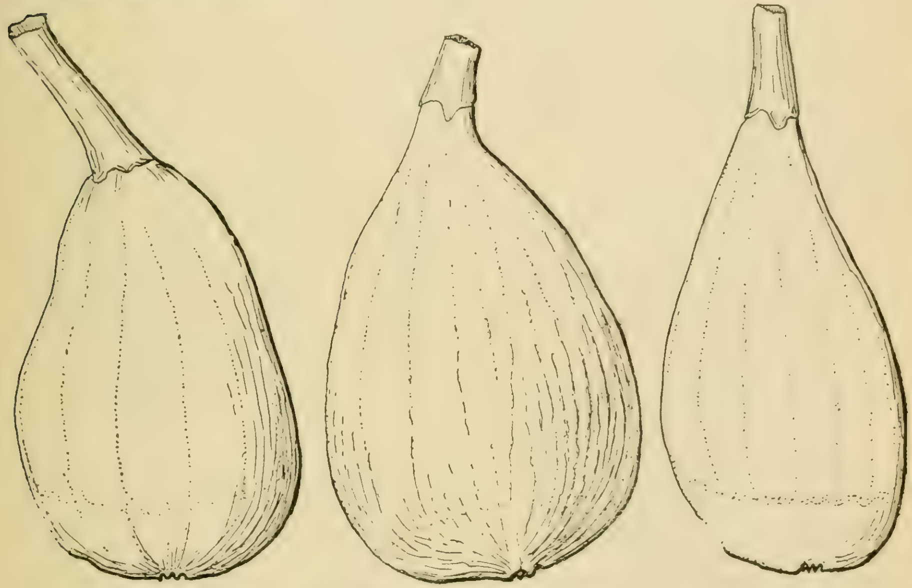


FIG. 65.—Grosse Grise Bifère figs.

Grosse Beurdoua—*Berdauda; Ficus carica* var. *serotina* Geny; *Verdaou.*—Size large, 2½ to 3 inches, distinctly turbinate; color greenish yellow: pulp red. Provence, at Grasse and St. Tropez, France.

Grosse Blanche Longue—MARSEILLAISE, LONG.
Grosse Blanche Ronde—BLANCHE.

Grosse Capucine.—France.

Grosse du Draguignan—AGEN.

Grosse Grise Bifère—*Grosse Servantine Bifère.*—Medium or above, 2¾ inches long by 1½ inches wide. Ovate pyriform: neck very short, but distinct, stalk short to medium, about one-fourth inch. Ribs distinct, but narrow, and hardly elevated; colored darker than the skin, of a violet brown. Eye small, open, slightly elevated, amber violet, with a dark iris. Skin downy, of a dark violet amber in the sun, turning to a pale olive green with yellow flush, with darker violet ribs in the shade. Bloom a very fine violet-pearl gray extending to the cheek, but not to the apex zone from which it is separated by a distinct line, between which and the apex there is no trace of the bloom. This is the most characteristic feature of this fig. Pulp deep red or dark rose: meat pale, greenish white. A very tender, good fig. This fig has been disseminated in California under the erroneous name of *Gray Bourgasotte*, but is distinctly different from that fig, which is round and flattened. (Figs. 66, 67.)

Grosse du Languedoc—GOURAUD NOIRE.

Grosse Jaune—Tapa Cartin.

Grosse Marseillaise—Marseillaise, Long.

Grosse Marseilles—Marseillaise, Long.

Grosse Marseilles.—Fruit medium, long, pyriform; skin greenish yellow, shaded brown; pulp dull red, second quality. (All according to Barron.)

Grosse Monstreuse de Lipari.—First crop: Fruit very large, 3 inches wide and nearly as high: turbinate, broad and flattened at apex: skin pale chestnut brown, darker on the side exposed to the sun, and marked with dark longitudinal ribs down to the sides, and with occasional dark spots, the whole surface covered with thick bloom. Stalk short and thick; eye large and closed; flesh dull red, thick, juicy, and well flavored. (Hogg.) Found by Hogg in an orchard at Bouches des Rhone, France.

Grosse Rouge de Bordeaux—San Pedro, Black.—It is doubtful if this is synonym of Black San Pedro. It is not a synonym of Bordeaux, which is a smaller fig.

Grosse Savantine Bifère—Grosse Grise Bifère.—Under this name the author has received from the Royal Horticultural Society of London a fig in every respect identical with Grosse Grise Bifère, characterized by the peculiar arrangement of the bloom of that fig. The bloom is absent from the apex near the eye, and there is a strong line of demarcation between the two zones.

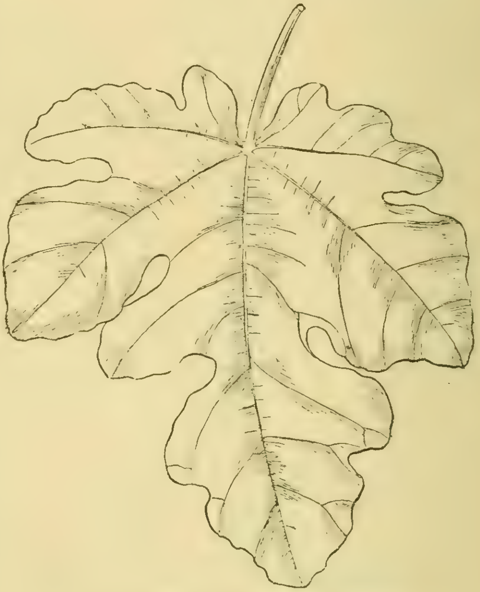


Fig. 67.—Leaf of Grosse Grise Bifère fig.

Grosse Verdale—Verdal, Long.

Grosse Verte—Adriatic.

Grosse Violette—Dauphine.

Grosse Violette de Bordeaux—San Pedro, Black.—This fig is not identical with *Bordeaux*, which is a smaller fig.

Grosse Violette Longue—San Pedro, Black.

Grosso Figo—Barnissotte, Black.

Guilijliana—Guiloana.

Guiliana—*Guijliana*.—Small, round, turbinate, about 1¼ inches: no neck; no stalk. Ribs few, distinct; eye small, open, scales large, violet amber. Large violet iris. Color dingy violet gray, greenish in shade, with blue bloom on stalk end, not reaching the equatorial. Pulp brownish salmon; inner scales rosy red. A sweet fig, but of very poor appearance. Leaves small, 3-lobed, very shallow lobes, almost entire. The spelling is somewhat in doubt. It was received under the synonym.

Hanover—Brunswick.

Hardy Prolific.—Large to medium: pyriform: about 2¾ to 2½ inches long by 2¼ inches wide: generally very flat at apex, lopsided and variable, very much in the shape of Brunswick fig, to which this variety stands very near; neck generally well set, but very short; ribs few, rough, wavy, but shallow, disappearing, and irregular: eye medium, flat, with low iris, scales pale amber: skin smooth, except for ribs, rather waxy, greenish on one side, violet olive on the other. Pulp amber white; meat white, very juicy and good, but not highly flavored. Second crop more turbinate and resembles Brunswick less than first crop. Tree a very strong grower with a fine head. Leaves medium to large, 5 lobed, about 7½ inches long by 7½ inches wide. A large, good fig.

Hirta—*Del Giappono: Ficus hirta: Hirta du Japon; Du Japon: Japanese fig.*—Size, 2½ by 1¾ inches: medium; round, with distinct neck and very short stalk; ribs indistinct; cheeks swollen and uneven: eye very open, scales small, rosy red, iris small, but rough skin smooth, but not waxy, not downy even when magnified. Color bluish brown, with red and green flush in the shade: pulp fine, pale amber; meat fine, white: seeds small: leaves small, 3-lobed, thick, almost entire. Tree a very poor grower. A Japanese fig of medium quality. There is said to exist another Hirta with downy fruit, also from Japan. (Fig. 68.)

Hirta du Japon—HIRTA.

Hospitalier.—A white drying fig from Salon, France.

Honey Fig—MEOU.

Howick—BROWN TURKEY.

Imperial—*Imperiau* (Nice): *Imperiala* (Italy): *Ficus imperialis* Risso.—Two crops. First crop medium and of poor quality. Second crop: 2½ by 2¼ inches, turbinate, lopsided and cracked, with a long neck which is quite hard. Color greenish gray, tinted violet red, with a bright red eye. Pulp pale red; quality medium. Common around Grasse, in Provence.

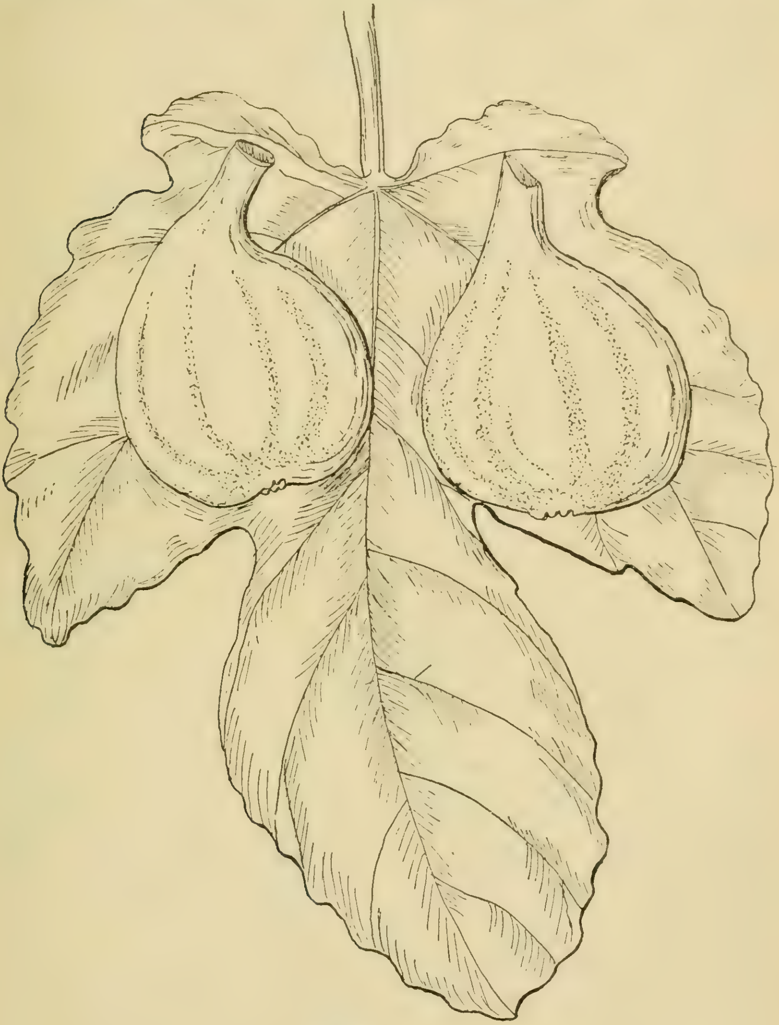


FIG. 68.—Hirta figs.

Imperiala—IMPERIAL.

Imperiau—IMPERIAL.

Ischia, Black—*Blue Ischia, Black Ischia.*—Small, about 1⅓ by 1½ inches: neck short; stalk short to medium; skin smooth, with few ribs, of which only one here and there is distinct. Color dark violet black, lighter and somewhat greenish around the apex. Neck as dark as the body; shaded and flushed green. Eye medium, open, scales rosy violet; no iris. Bloom thin, very dark blue. Pulp red; meat greenish amber. A fair fig of small size, sweet, but poor flavor. Second crop is larger, sometimes 2½ inches long by 1¾ wide. Skin with numerous very small golden specks; ribs more distinct and numerous. Eye flat, open; pulp violet red; better quality than first crop. Leaves 3-lobed, almost entire. A handsome rounded tree, giving much shade. A common variety, but one which could easily be dispensed with. The two Ischias are undoubtedly only color varieties of the same form. The leaves, habit of trees, shape of trees, etc., are the same. The form of the figs in the two varieties is almost the same, though in the black form the fig is slightly longer. (Fig. 69.) The spot on the leaf (*a*) illustrates the appearance of the iris of the eye.

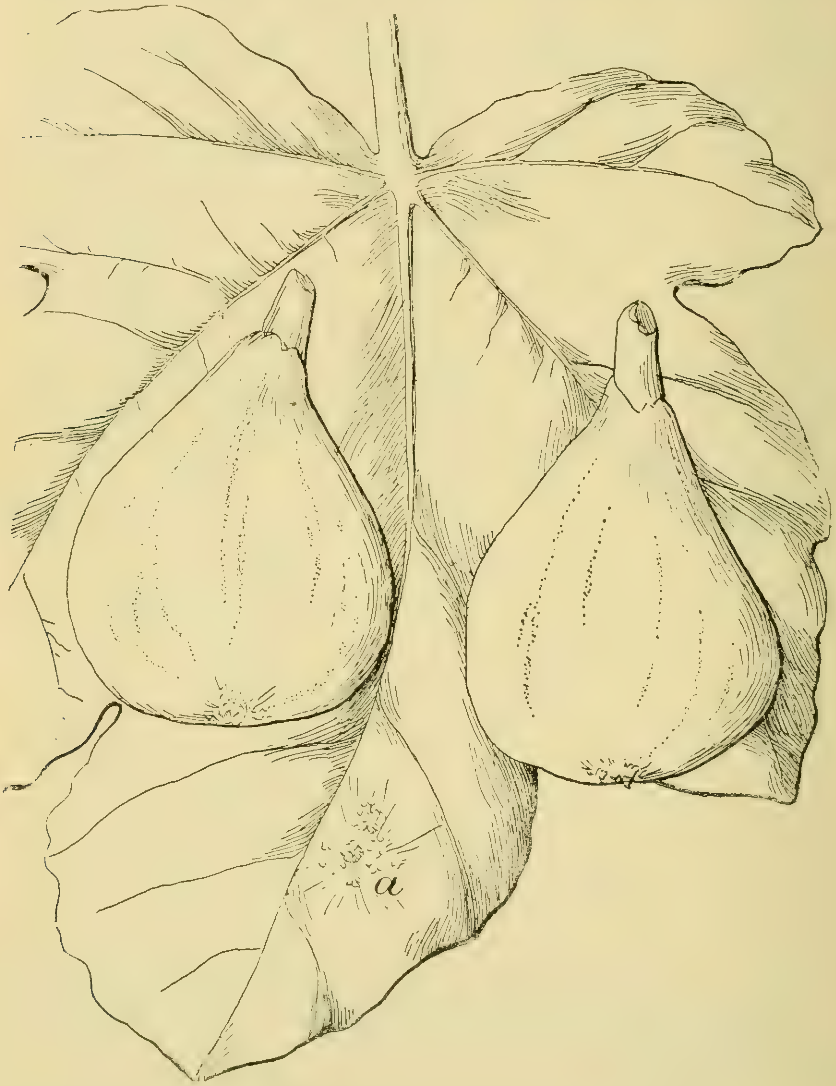


FIG. 69.—Ischia, Black figs.

Ischia, Brown—*Chestnut-colored Ischia.*—Medium, roundish turbinate; eye ver large, color light brown; skin thin, bursting easily after rain. A color var ety of the Black Ischia.

Ischia, White—*Green Ischia; Singleton*, Hogg; *Brocket Hall*, Hogg.—Size small or very small, about 1¾ by 1¾ inches; shape round, with a small, narrow, distinct neck; stalk very short or variable, always very thin and weak. Ribs distinct on the cheeks, less pronounced toward the stalk, and entirely disappearing on the apex. Eye open, scales amber rose, large, no iris and the region around the eye not in the least elevated. Skin smooth, bluish green, with a light-brown flush and violet-brown ribs. Pulp rosy red: meat white. A sweet fig, but very small and with no flavor. Requires moist, rich soil. The crown is large, round, dense, and compact. Leaves shallow, 3-lobed, with rounded lobes. A very common fig in California, but one which hardly deserves cultivation when so many superior varieties are to be had. (Fig. 70.)

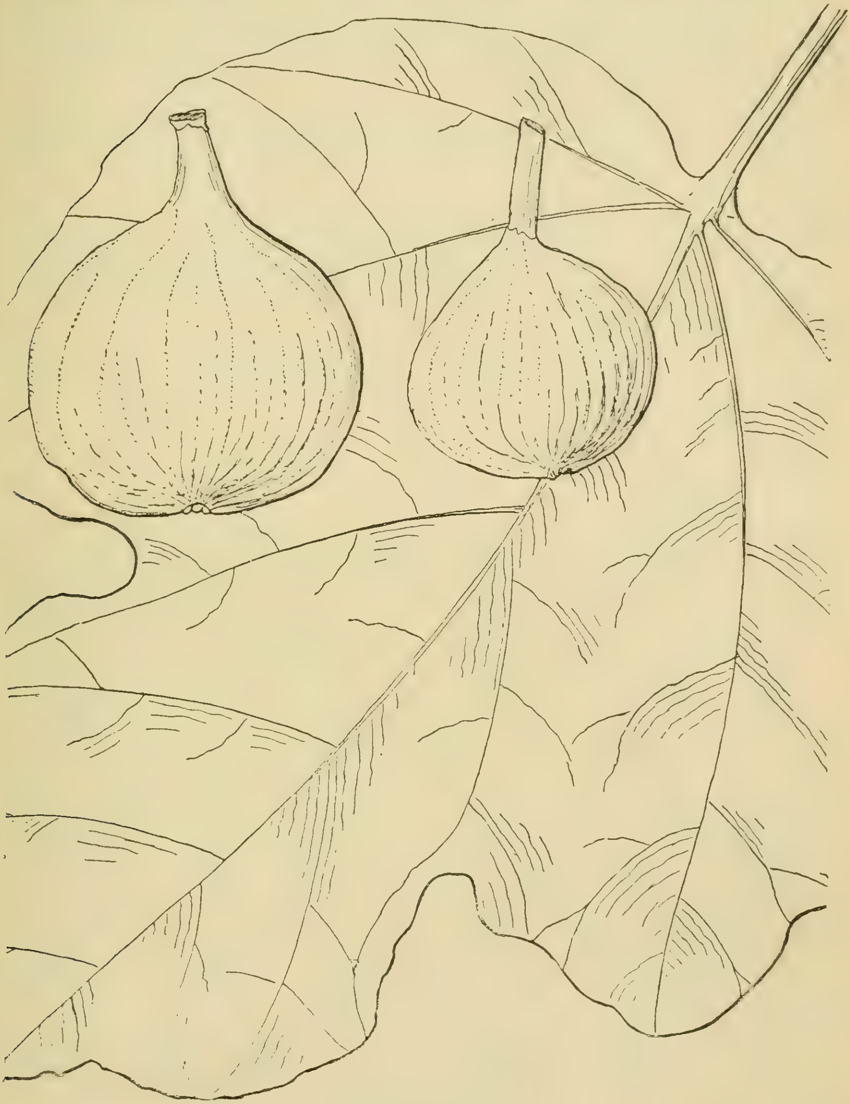


FIG. 70.—Ischia, White figs.

Italian—BROWN TURKEY.

Japanese Fig—HIRTA.

Jasper—*A bois Jaspè; A bois et fruit Jaspè* (France).—Fruit medium to large, 3 by 2 inches, pyriform; neck short and only its apex well set; stalk short or none; slightly tapering; apex flat; ribs distinct, irregular, confluent. Eye small, closed; scales upright; color, green and bronze, with pale and scant bloom. Pulp fine; seeds few and small; color of pulp pale rosy amber. Sweet and juicy, not highly flavored, but good. Leaves coarse, medium size, deeply 5-lobed, rough both above and below; stalk bent. Not identical with either Panachée or Col de Signora Panachée.

Jaune de Toulouse.—Large, oblong; yellow skin and pulp. A very handsome fig. Medium early.

Jaune Hâtive—EARLY WHITE.

Jerusalem—*De Gerusalem; Di Gerusaleme.*—Medium, roundish; stalk stout and short. Eye quite closed; skin black, with reddish mahogany toward the stalk; blue bloom. Pulp dark blood red, rich, sweet, and finely flavored. A very good fig.

Jorest.—Medium, oblong turbinate; red skin; pulp white. A very productive and handsome French fig of exquisite quality.

Kargigna—*Karginga.*—Medium or below medium, turbinate; skin thin, white; pulp amber. A rather early Dalmatian fig, of medium quality, good only for table, and hardly worthy of cultivation. Introduced into California by G. N. Milco. Possibly identical with Natalino.

Karginga—KARGIGNA.

Kassaba.—A Smyrna fig requiring caprification. Skin yellowish green. The shape is that of a somewhat flattened onion—transversely ovate. Pulp blood red. (See Smyrna figs, p. 278.)

La Castagnola—CASTAGNOLA.

La Douqueiretta—CABROLIANA.

La Gentile—GENTILE. See also DOTTATO.

La Melette—ANGÉLIQUE.

Lady Heart—CUERS.

Lampas—LAMPEIRA.

Lampeira (Algarve)—*Portoghese* (Italy); *Lampas* (Portugal).—Size, 4½ by 2½ inches; shape roundish-pyriform, with long, slender neck, well set and shouldered. Stalk very short; shape rather irregular, lopsided, largest diameter at center. Eye medium, raised; scales pink. Skin thin or medium, greenish brown, green in shade, brownish violet in the sun; pulp coarse, rose colored, very sweet, juicy, but lacking flavor. Leaves small, 3 to 5 lobed, but lobes very shallow. Tree of medium growth; first crop of brebas abundant. Second crop drops. A fig common in northern Italy, and cultivated for its first-crop figs. Also common in Algarve, Portugal. Link says that in Portugal the first crop of this variety is called "figos Lampas," and is especially cultivated around Tavira, in Algarve. The second crop he designates as "figos vendimos," which is probably an error, the author having good ground to believe that the "figos vendimos" come from a different variety. This fig belongs to the San Pedro class, the trees sent to Niles through the Department of Agriculture having matured splendid second-crop figs after having been caprificated. It is certain, however, that the Lampeira is one of the finest of all first-crop figs, and that it should be widely distributed. What the White San Pedro is for Andalusia in producing the luscious brebas the Lampeira is for southern Portugal. (Fig. 71.)

Lardaro.—Size large to medium, often 3 inches long by 1¾ wide. Neck long, tapering from the center of the fig. Stalk very short. Numerous ribs, which are warty and irregular. Eye flat, small, but open. Color of skin olive-yellow, with dingy violet brown ribs. Stalk and neck green without the brown. Eye with a violet iris, the scales being small and not prominent. No prominent bloom. Pulp rosy violet, rather pale. Inside hollow. Meat thick, white or yellow. The pulp is very coarse, but pleasant. Tree is a medium grower, with large 3-lobed leaves. Branches straggling spreading. An abundant cropper. In form this fig resembles Pied du Bœuf. The most common fig around Naples, Italy. Valued on account of its abundant crop.

Large Black Douro—DOURO.

Large Blue—BROWN TURKEY.

Large White Turkey—BRUNSWICK.

La Rousse—ROSE BLANCHE.

La Sucrada—SUCRADA.

La Toscana—TOSCANA.

Lee's Perpetual—BROWN TURKEY.

Leker Ingir.—A Smyrna fig requiring caprification. Color of skin greenish-ochre. Not handsome. Skin with dark specks. Stem and neck very short or absent. Imported by Roeding. (See Smyrna figs, p. 278.)

Levant—*Turqui.*—Very large, oblong; skin white: leaves laciniate. (All according to Duhamel.)

Levenssana—*Ficus smithii* Risso: *Ficus sylvestris* var. *alpestris* Geny.—Size medium; 2¼ inches diameter, globular, flattened; skin hard, glossy, adhering to the pulp; color of skin pistachio green on the stalk end, brownish violet on the apex side. Eye red, surrounded by a violet iris; pulp bright red. Very agreeable taste. Common at Levens, near Nice, France.

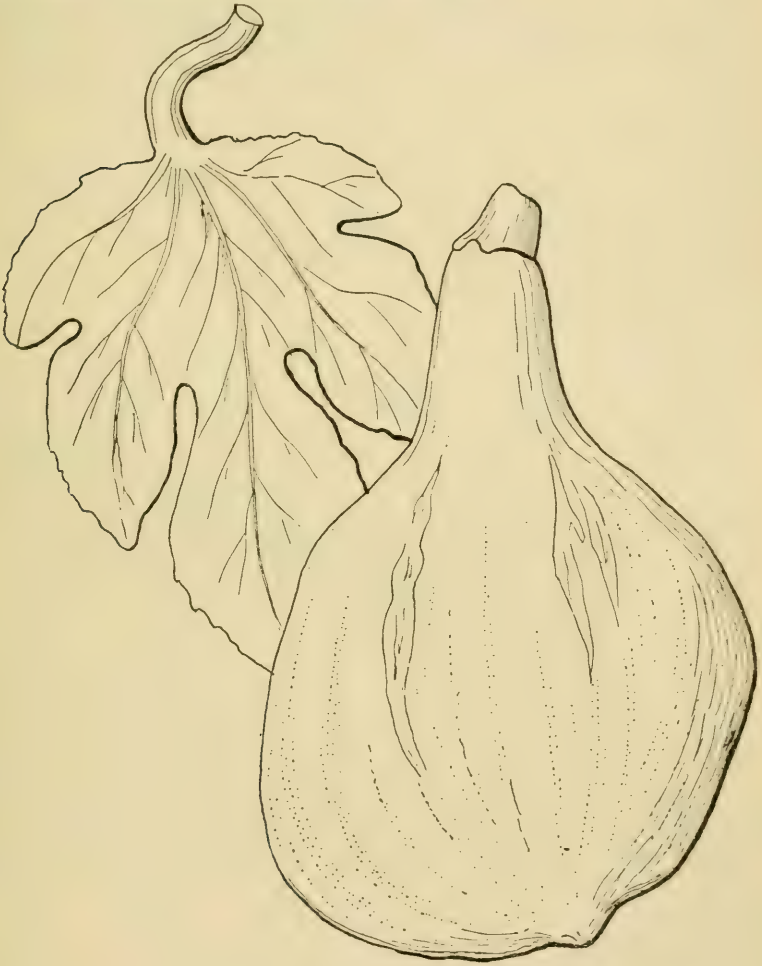


FIG. 71.—Lampeira fig.

Lipari—*Petite Blanche Ronde; De Lipari; Blanquette; Blanquetto* and *Esquillarello* (Provence); *Verte Petite; Bouton du Guétre.*—Size very small, the smallest of all figs of the *Ficus carica* species—about three-fourths inch to 1 inch long. Globular, with longitudinal ridges; stalk one-eighth inch long. Color green, turning yellow or whitish at maturity, with a thin bloom. Pulp pale rose, opaline, or pale coppery. In a warm climate a sweet and good fig. (According to Hogg.)

Liviana—PISSALUTTO BIANCO.

Lob Ingir—*Bulletin Smyrna; Commercial Smyrna; Erbeghli; Erbelli; Erbeili.*—Fruit sulphur yellow when ripe, this color lasting only two days. Pulp pale honey colored without red. Form of fig decidedly flattened, as an onion.

Before full maturity the pulp is streaked red. Requires caprification. The figs of the caprificated Smyrna fig should never be cut from the tree, but be allowed to fall naturally to the ground. The dropping of the ripe figs always occurs at the proper time—that is, when the figs are fully ripe and ready for drying. If the figs are cut from the tree before they are ready to drop they will remain hard and inferior. In order to insure a perfect dried fig the ground under trees should be soft and mellow and there should be no large clods. As soon as the figs have dropped they are at once picked up and examined. Many of them are ready for packing without further drying. In case they are too moist or pulpy one or two days' exposure to the sun should suffice to bring them to the proper state of desiccation for packing. This is the true Smyrna fig of commerce, grown and extensively cultivated in the valley of the Meander near Smyrna. It is a distinct fig, and this and no other fig should be known as Smyrna, if this name is to be used at all. The promiscuous use of the name Smyrna figs can not be too much condemned. (See Smyrna figs, p. 278.)

Long Marseillaise—Marseillaise, Long.

Long Naples—Brown Turkey.

Long Verdal—Verdal, Long.

Long Yellow—*Longue Jaune.*—Skin reddish yellow. A long, turbinate fig.

Longue Jaune—Long Yellow.

Longue Marseillaise—Marseillaise, Long.

Lucrezia—Col di Signora Bianca.

Lusitanica.—France. Possibly identical with Lampeira.

Madame Trille—Trille.

Madeleine—Magdalen.

Madonna—Brunswick.

Magdalen—*Madeleine; De la Madeleine.*—Size below medium to small, about 1½ by 1½ inches, quite round, or slightly pyriform and obtuse. Ribs distinctly prominent and rough, especially toward the stalk, while diminishing in prominence toward the eye, but entirely disappearing immediately around it. Stalk longer than one-half the fig eye open, comparatively large, but depressed: scales very small and few o a pale whitish amber. Skin greenish-yellow or yellow on cheek, greenish in the shade; pulp amber white: meat white. A very delicious little fig, far superior to the Ischias and the Celestes. (Fig. 72.)

The above description is taken from fig trees imported from France by Mr. Gillet to California and grown in Santa Clara Valley. They differ from those received by the Royal Horticultural Society of London, as seen below. Dr. Hogg gives *Madeleine* as synonymous with Angelique, which is erroneous, Angelique is a distinct fig of larger size, much more flattened, and of the shape of a flat onion.

Madeleine—*De la Madeleine.*—Size medium; 2½ inches long by 1¾ inches wide; pyriform: lopsided. No distinct neck and very small stalk. Ribs shallow, numerous, confluent; eye medium, open; scales large. Skin waxy, cracking, of a yellowish-green color; pulp coarse, rosy amber and pure amber toward stalk end. Vinous and juicy, but not highly flavored. Tree strong grower, with large, coarse, shallow, 3-lobed leaves, about 9 inches long by 8 wide, woolly underneath. This fig was received thus named from the Royal Horticultural Society of London. It is a distinct fig from the true Magdalen.

Mahounaise.—Color red. Salon and St. Remi, France.

Malta—*Small Brown.*—Small, roundish turbinate, compressed at apex; pale brown when fully ripe; pulp pale brown. Dries well and becomes a perfect sweetmeat. (Hogg.)

MAPLE-LEAVED SMYRNA. (See Smyrna figs, p. 278.)

Maravilla—Princessa.

Maris No. 2—Gouraud Noire.

Marseillaise—Athènes.

Marseillaise—Marseillaise, White.

Marseillaise, Black—*Black Marseillaise; Black Provence; Noire de Provence; Reculver?* Hogg; *Ficus phoceana* Risso; *Marseillaise Negra* (Provence).—Size medium; shape oblong-pyriform, with a distinct neck; body not flattened at apex; stalk long, about one-third the length of the fig. Ribs distinct, especially toward the neck, gradually disappearing toward the eye. Eye closed, medium size; scales large, red, slightly standing out. Skin waxy and slightly downy, fine, of a dark bluish black, with very thin bloom. Pulp rosy red; meat white, not very finely grained, but good. No large seed. Provence and Nice. This fig is not related to the Marseillaise, White, nor to the Athènes and does not bear a few large seeds, as do all figs related to Marseillaise, White. (Figs. 73, 74.)

Marseillaise, Long—*Long Marseillaise; Grosse Blanche Longue; Longue Marseillaise; Grosse Marseilles; Grosse Marseillaise.*—Large, about 2½ by 1½ inches; longer than wide; skin thick, white or greenish with brown shade; pulp dull red; leaves 5-lobed, margins crenate, lobes sharp, pointed. Requires moist soils. A fair fig which dries well. South of France. This fig must not be confounded with either the Black or the White Marseillaise, as it is not related to either of these figs. The common name "Marseillaise" to all these varieties does not indicate that they are closely related or resemble one another, but simply that they are, or were once, principally cultivated near Marseilles or perhaps originated there.

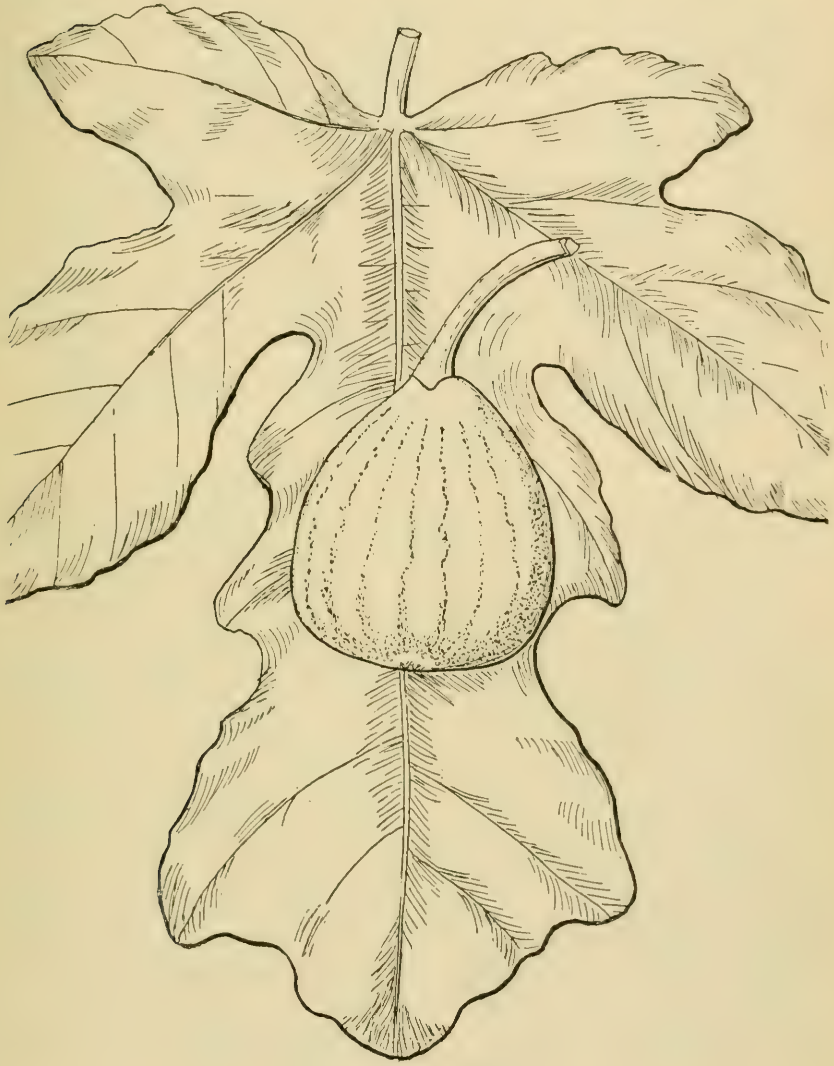


FIG. 72.—Magdalen fig.

Marseillaise Negra—MARSEILLAISE, BLACK.

Marseillaise, White—*Marseillaise; Figue de Naples; Naples; White Naples; White Standard; Grosse Marseillaise* (all according to Hogg); *White Marseillaise.*—

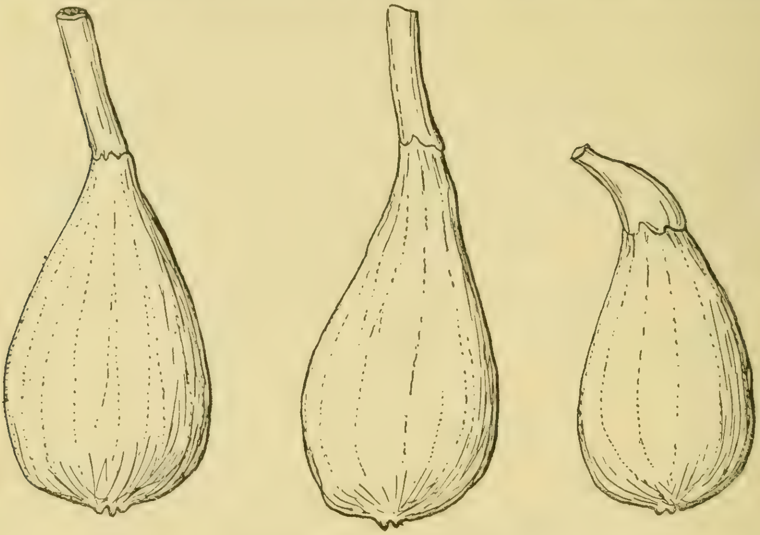


FIG. 73.—Marseillaise, Black figs.

Medium or below medium; ovate, pyriform, or even quite round; 2 by 1⅛ inches to 1¾ inches; neck very short, sometimes smaller; stalk medium. Ribs numerous and distinct, but not greatly elevated, more like very distinct veins. Apex flattened, or slightly rounded at the eye. Eye large, open, but not elevated; scales small, amber green, flat, not standing out. Skin slightly downy, not waxy, mottled, with smaller or larger specks of pale white on a ground color of pale yellowish green, evenly diffused; pale yellow around the apex; when not fully ripe bluish-green. Very light pale bloom. Meat white; pulp amber, transparent, with a few very large seed, very sweet, juicy, and pulpy. One of the best drying figs, though small in size. Extensively cultivated in Provence, France. The Athènes, Marseillaise, White, Raby Castle, and some other figs form a natural group characterized by possessing a few very large seeds, etc. These varieties have been confounded by most writers, one copying the erroneous description of the other without further investigation. Hogg gives as synonyms a number of figs, such as Raby Castle, White Genoa, etc. which are distinct, and some of which do not even belong to the Marseillaise group. The figs belonging to this group are useful for drying, but of medium quality as table figs. (Fig. 75.)

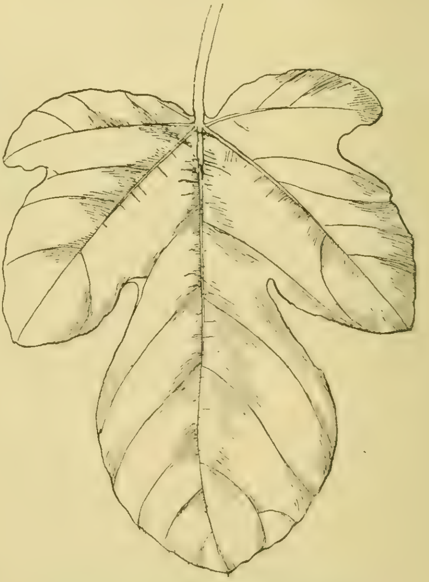


FIG. 74.—Leaf of Marseillaise, Black figs.

Marseillasa—ATHÈNES.

Martale.—Provence.

Martinique—*Black Martinique.*—Below medium; round, with short neck; ribs prominent; eye open; stalk very short; color deep blackish purple; pulp dark red, stiff, and oily. Very good. This is all according to English authors. There is also a white *Martinique.*

Martinique—MARTINIQUE, WHITE.

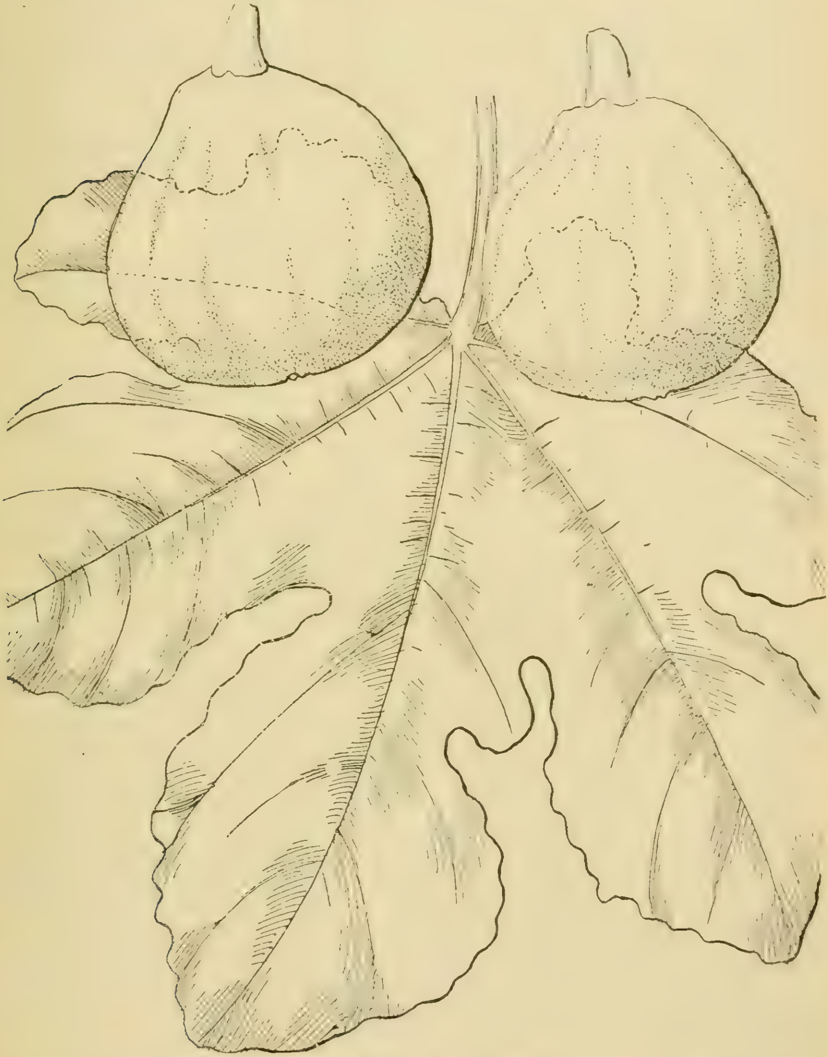


FIG. 75.—Marseillaise, White figs.

Martinique, White—*Martinique.*—White Martinique, small, 1¼ inches long by 1¼ wide, pyriform; neck short, but very distinct and well set; stalk short or none; cheeks prominent, swollen; ribs very distinct, few, and broad from base of neck to eye; eye open, large, with elevated iris; scales rosy; skin rather rough, yellowish-green; ribs pale violet-reddish, and a reddish or violet flush, which is faint on the sunny side. Violet pale bloom on neck. Pulp rosy red, with few seeds; meat pink. Very sirupy and juicy, and well flavored. Leaves medium, very deeply lobed, lopsided, margins crenated, wavy, lobes five. This fig is supposed by Rev. W. Wilks to be synonymous with *Angelique*, but this the author considers incorrect. A very heavy bearer. A most excellent fig for canning.

Marzelli.—Violet purple; pulp white opaline. Italy.

Matarassa—*Figue de Grasse; Grasse; Grassenque; Figue Grise; De Grasse; Grassale; Ficus grassensis* Risso.—Very large, 8 to 9 inches in circumference by 3 inches long; very flattened at apex, else turbinate; neck short; ribs distinct, longitudinal; stalks very short, scarcely perceptible; eye open; skin thin, yellowish white, covered with blue bloom; pulp very dark red; good for drying; leaves 3-lobed, with undulating margins and obtuse lobes. An extremely handsome fig of medium quality when fresh, but better when dried. The tree is a very vigorous grower and requires moist and rich soils. Greatly to be recommended for rich bottom lands.

Matelassa—*Matelassiera, Ficus sylvestris* var. *ventricosa* (Geny).—First crop large, 4 by 2¼ inches; lopsided, one side protruding; skin blackish red; pulp yellow. One of the few figs with dark skin and white or yellow pulp. Nice and Provence.

Matelassiera—MATELASSA.

Mattaro—ALBO.

Mecque.—A French fig for drying and table.

Meirana—*Ficus meirana* Risso.—First crop very large, brownish black; pulp red. Second crop heartshaped, violet black; pulp rose-colored. Levens on the Riviera, France.

Melette—ANGÉLIQUE.

Mentone—MENTONASCA.

Mentonasca—*Figue de Mentone, Mentone; Ficus erin.* var. *mentonensis* Geny.—Above medium, 2¾ by 2 inches; pyriform; with a long neck; skin thin, tender, of a dark violet color; violet meat below the skin; pulp reddish, very sweet. Nice, Mentone, and their vicinity, France.

Mentonensis—MENTONASCA.

Meou—*Figa de Meou* (Provence); *Figue Mielleuse; Ficus mellifera* Risso; *Ficus sylvestris* var. *smyrna* Geny; *Honey fig.*—Two crops: First crop large, turbinate, 2 to 2½ inches diameter; skin thin, cracking, greenish-yellow, violet below the skin; eye projecting; pulp red; very good. Second crop globular, smaller, about 1¾ to 2 inches diameter; pulp red, paler than first crop; good for drying, but inferior when fresh. This fig was considered by Geny as identical with the true Smyrna fig, which is erroneous. It is cultivated in Savoy, at Nice, and other places.

Merengiana—*Ficus melitensis* Risso; *Ficus erin.* var. *melongena* Geny.—First crop oblong-ovate, largest at the apex; skin thin, cracking, of a blackish-violet purple; meat violet streaked; rather sweet. Nice and the Riviera.

Merioun—*Figa a Merioun* (Nice); *Fico fetifero; Fico dall' Osso* (Italy); *Ficus erin.* var. *fœtifera* Geny; *Ficus nucleata* Risso.—Two crops: First crop 2½ to 3 inches in diameter, sometimes bell-shaped, flattened; dark violet color, or greenish yellow, striated violet; sometimes contracted at the middle like a gourd, the apex part being dark violet, the stalk part being greenish yellow; eye very large open, emitting one or more small figs similar to the mother fig; pulp red, sweet, agreeable, but dry and hard around the eye. Second crop smaller, but with similar characteristics. The monstrosity of this fig is similar to the one found, for instance, in roses, where the axis is prolonged, forming a new rose; or as in certain citrus fruits, such as the navel orange, etc. A curious, but not a valuable fig. Rare. Nice and Provence.

Merlinga—*Ficus erin.* var. *gemina* Geny; *Twin fig.*—Below medium; 1¾ inches diameter, turbinate; color brownish black, fine violet at the stalk and neck; neck long and very slender; pulp red. Nice and Provence.

Messongue.—Very large. At Salerno, France.

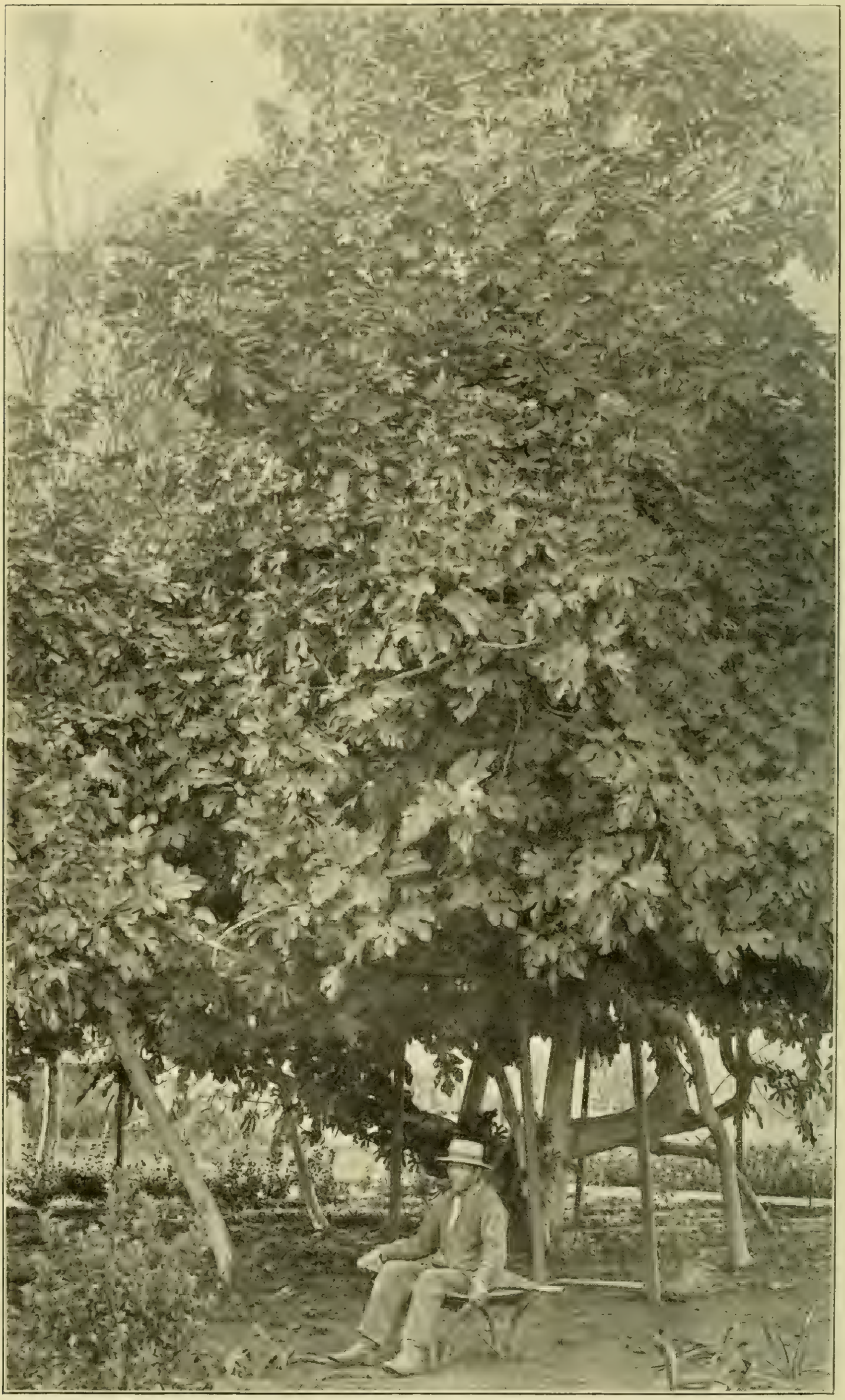
Mezzith.—A black fig from Kabylia which requires caprification.

Migliavolo.—Italy.

Minna—SAN PEDRO, BLACK.

Minna di Schiavo—SAN PEDRO, BLACK.

Mission—*Black Mission, Black California, California, Black Mexican.*—Two crops: First crop or brebas large to medium; long turbinate with the greatest diameter between the center and the apex, which is rounded, sometimes even pointed, causing the shape of the fig to become ovoid. Neck long, gradually set; stalk medium to short; ribs distinct, well marked. Eye prominent, raised, open, but not very large; scales rosy. Skin rough, slightly hairy or downy, deep mahogany violet with reddish flush in shade and on stalk covered with a thin bloom. Pulp not fine, red, but not blooded, rather brownish-amber red, shaded dark amber; sweet, but not flavored. The tree



Mission Fig Tree, California.

is a good grower, with the lower branches drooping, and light bark. Leaves 5-lobed, glossy, longer than broad and lighter green than most other figs, and most characteristically mottled with lighter, yellowish green. A coarse fig, which, however, thrives and bears well almost everywhere. It dries well and when dry is rather of pleasant quality and seems especially adapted to California and Arizona, where it is extensively distributed. Also common in Sonora and Baja California, and probably in other of the Pacific States. Introduced by the Franciscan missionaries in the eighteenth century. There is only one variety of Mission fig. The general belief that the Mission is a distinct California fig is erroneous. We can no more lay exclusive claim to this fig than can Mexico and Chile. It was undoubtedly brought from Spain or Portugal at a very early date after the conquest. The early padres and missionaries in the Pacific coast States cultivated no other variety of fig. (Pl. XV.)

Moissoa—MOUISSOUNA.

Moissonne Noire—MOUISSOUNA.

Monaco Bianco—*White Monaco.*—Large, 2½ by 2 inches; shape rounded, turbinate, flattened. Neck small, but very distinct and well set; ribs numerous, slightly elevated, narrow, but very distinct down to the apex, but not so marked on neck. Eye very open, scales large, dark amber, iris slightly elevated from a surrounding depression, with faint color of dark green; skin dark bluish-green, even all around, or the shaded side only slightly paler in sun, mottled with dark amber. Thin bloom; pulp dark rose; meat amber yellow. A very good, juicy fig, splendid for table; does well at Niles, Cal. (Fig. 76.)

Monaie.—Second crop above medium, globular, but compressed; color ashy violet, somewhat bronzy; skin thick; pulp brown. Good.

Monege blanche—France.

Monginence—DOUQUEIRA NEGRA.

Monnoire.—Medium; rounded; green. France.

Monstreuse.—Medium, about 2½ by 1¾ inches wide; turbinate, with a short, thin neck, bent and well set; no stalk. Skin smooth, with faint, irregular, and crenated ridges; apex flat; eye medium to small, open, with erect scales. Skin waxy, covered with a fine bloom around the stalk and ending sharply before the equator is reached. Color uniform pale green; pulp brownish salmon, dense, vinous, but not highly flavored. Leaves large, about 10 inches, 3-lobed, without spurs, very coarse underneath. This fig is said by Rev. Dr. W. Wilks, secretary Royal Horticultural Society of London, to be identical with Grosse Monstreuse de Lipari, but the fig sent by him and from which the above description is taken is not identical with that fig, which is said by Hogg to be brown in color.

Montegas.—Above medium. A drying fig.

Moresca—*Gentilla Roussa* (Nice); *Ficus sylvestris* var. *mauritanica* Geny.—Two crops: First crop very large, 3½ to 4 inches by 2½ inches; pyriform, lopsided, with a very long neck. Color bright gray; eye star shaped, raised, red; pulp pale red or yellowish. Grown around Nice, France, and supposed to have been introduced from Algiers.

Morlaise.—Very large. France.

Moscadello—ALBO.

Mouissouna—*Moissonne Noire; Bouissonne; Mouissonne; Moissoa* (Nice); *Mouissone* (Italy); *Mouissonne Noire* (Provence); *Ficus mouissona* Risso; *Ficus erin.* var. *salsula* Geny; *Figue violette* N. Duhamel.—Two crops: Second crop almost globular, turbinate, 1¾ inches long by 2 to 2½ inches wide; broader than long, flattened at apex. Skin thin, fine, tender, of a blackish violet color, with blue bloom. Eye reddish; pulp red, soft, very sweet and like a date in taste. Best of all the early figs, but inferior to Barnissotto Black, which, however, is later. Leaves 5-lobed, crenate, lobes acute. First crop longer, very few. Requires a soil neither too dry nor too wet; in the former the figs would drop and in the latter they would become of poor taste. (Fig. 77.)

Mouissone—MOUISSOUNA.

Mouissonne—MOUISSOUNA.

Mouissonne Fugia.—A variety of MOUISSOUNA.

Mouissonne Noire—MOUISSOUNA.

Mourenao—*Bagassa* (Villa Franca); *Ficus mourenao* Risso; *Ficus sylvestris* var. *olivula* Geny.—Small, 1¾ inches diameter; almost globular; skin thick, cracking, blackish violet; pulp red, medium quality. Nice and Provence. According to Duhamel there is a Mourenao with oblong fruit and white pulp; leaves 3-lobed, obtuse, undulating, though I believe an error was made in describing the pulp and that both descriptions refer to the same variety.

Murrey—Brown Turkey.

Mussega—*Cougourdana; Ficus linneana* Risso; *Figue Reine* Duhamel; *Cougourdane* Geny; *Mussega Bianca; White Mussega.*—Second crop medium, about 2½ by 1¾ inches: shape pyriform, largest at apex and with a narrow neck, but less so than *Tapa Cartin.* Skin thin, greenish white, spotted: red star-shaped eye: pulp lively red, of agreeable taste. (September to December.) Nice, Aix, and S^t. Remy, France,

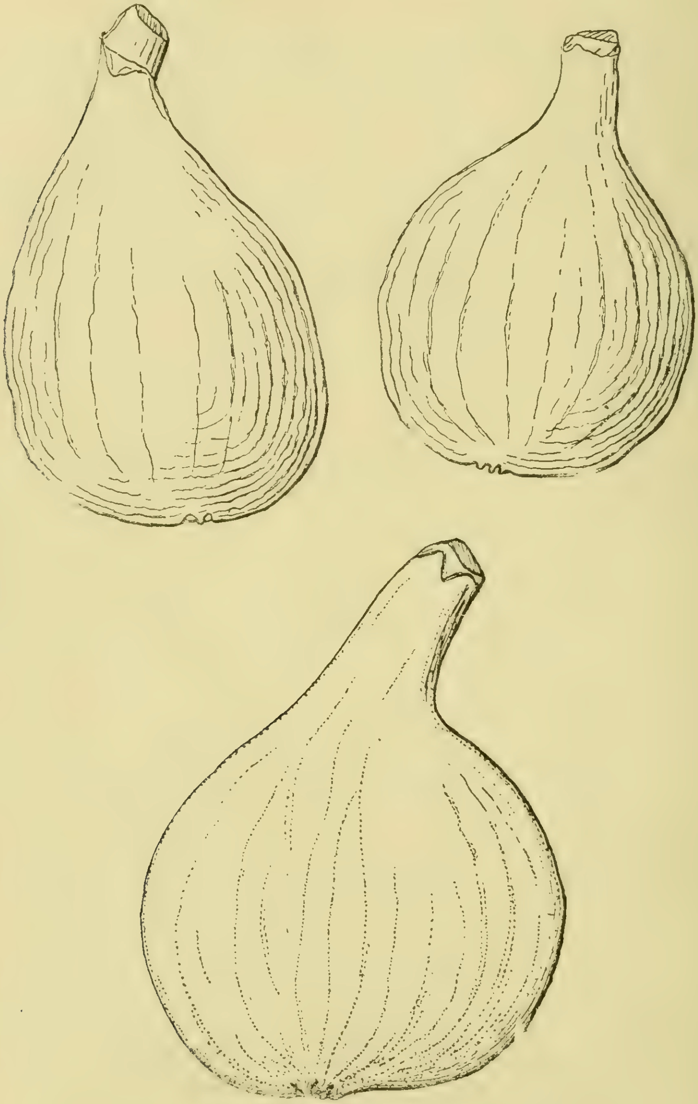


FIG. 76.—Monaco Bianco figs.

Mussega Bianca—Mussega.

Mussega Negra—*Ficus punctulata* Risso; *Black Mussega.*—A variety of the preceding with skin first a bright green, dotted with white, later turning to a dark blackish violet. Provence, France.

Naples—Marseillaise, White.

Napolitain—Napolitan.

Napolitan—*Napolitano; Napolitain.*—Two crops: First crop large, egg-shaped, oblong, with deep longitudinal ribs; skin pale yellow, thin; pulp coarse, but juicy, white. Second crop one-half smaller, turbinate; color brilliant green at base, violet toward the crown or apex; skin thin; pulp very fine, oily, sweet, red. A very good fig, suited to drying. Is much dependent on the locality where grown and varies from very good to poor.

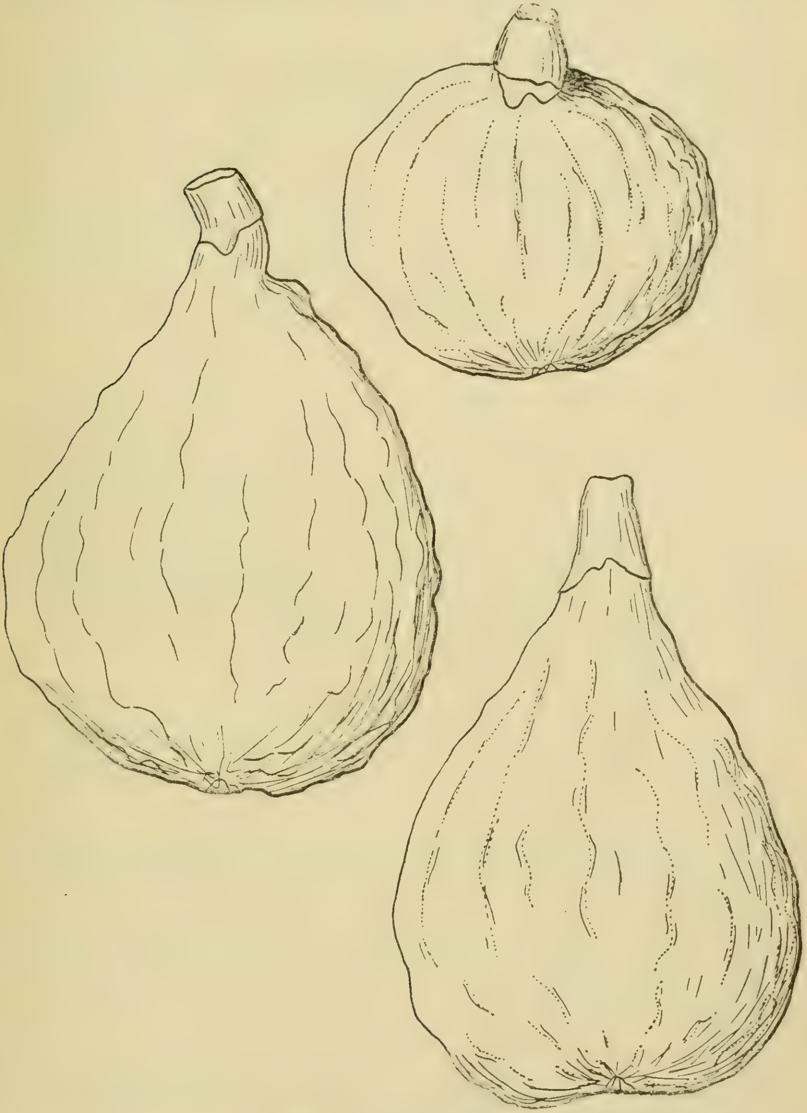


FIG. 77.—Mouissouna figs.

Napolitani—Dottato.
Napolitano—Napolitan.
Natalino—*Della Cava; Tre Volte; Pasquale; Christmas Fig; Winter Fig.*—A fig which ripens very late all through the winter, withstanding the frost, at Naples, and ripening after the leaves of the fig tree have fallen. Probably identical with Kargigna.

Nebian—Adriatic.—There seems now to be no doubt but that the *Nebian* and *Grosse Verte* are identical with the Adriatic of the California growers. The description given by Dr. Hogg tallies exactly with our Adriatic. Trees received from the Royal Horticultural Society in London under the name of *Nebian* and *Grosse Verte* and grown on the place of John Rock at Niles, Cal., resemble exactly our Adriatic figs. Our Adriatic fig, however, is now so well known that a change of name can not be desirable. This variety is, among other things, characterized by a peculiar, and not always desirable "burnt" taste, especially prominent in the dried fig. This taste was also found in the *Nebian* and *Grosse Verte*, and the author considers it absolutely beyond any question that these three varieties are identical. If a change should be made in name, the word *Nebian* should be preferred.

Negrau—*Figa Negrau* (Nice); *Ficus sylvestris* var. *rufescens* Geny.—Second crop: Two inches by five-eighths inch: pyriform, reddish brown: meat violet; pulp red. Nice and Provence, France.

Negretta—*Ficus nigra* Risso; *Ficus erin.* var. *saxetana* Geny; *Rock Fig.*—Two crops. Second crop medium; about 2 inches long by 1¼ inch wide: egg shaped, rounded, similar to a small Douqueira. Color shining black, with blue bloom; skin thick, firm, adhering to the pulp, which is pale yellow and of good quality when fully ripe. Many seeds. Thrives well in the rockiest places, where no cultivation is possible and where no other tree except the olive would thrive. Nice and Provence. Is recommended for places in Arizona and southern California where irrigation is impossible.

Negro d'España—Genoa, Black.

Negro Largo—San Pedro, Black.

Negrone—*Negronne.*—Size medium to below, 2 by 1¾ inches, pyriform, tapering with a distinct, slender, variable neck. Stalk distinct, long: stalk and part of neck bent over and rising in a curve upward, where the fig hangs down. Ribs few, distinct, disappearing on apex, which is rounded; eye small, closed: scales few, large; small iris. Skin smooth, except for the ribs: color deep violet-black: pulp fine, dense, with small seed: meat violet-white, pulp brownish red to amber with violet flush: inner scales ocher yellow. Tree a strong grower. Leaves long, about 9 by 6 inches, very deeply lobed, the middle lobe being much the longest: three deep large lobes and two shorter ones near the base of the leaf. Under side rough. A very good little fig. It is not identical with the Violette de Bordeaux, as suggested by Barron. This latter fig has small leaves, otherwise the fruit is very similar.

Negronne—Negrone.

Nero Oblungo—San Pedro, Black.

Nibran—*De Nibran.*

Nigra.—Small, pyriform: skin dull yellow, shaded purple: flesh bright red, juicy, not rich (Barron). This is undoubtedly a variety brought to England under a wrong name, as it is difficult to understand how a "dull yellow" fig could be called Nigra. It is only another instance of the mixing of names. The variety is entirely distinct from *Nigra*—Genoa, Black.

Nigra—Genoa, Black.

Nigrette.—Very small, oblate, with short neck: stalk one-eighth inch long; eye open; skin dark blackish purple over the apex and halfway toward the stalk, where it shades off to reddish purple. Pulp rose colored, juicy, and sweet. Not identical with Negretta.

Noire d'Espagne.—Extremely early, small, round, and regular, stalk short; eye closed; red ribs; skin quite black, with thick blue bloom, cracking when ripe; pulp tender, deep rose. A handsome fig of fair quality (Hogg). A different fig from *Negro d'España*—Genoa, Black.

Noire d'Espagne—Genoa, Black.

Noire de Languedoc—San Pedro, Black.

Noire de Provence—Marseillaise, Black.

Noiremoutier.—Two crops: medium, oval: color yellow with red stripes. A very rich table fig from the valley of the Loire, France. Introduced into California by Felix Gillet, of Nevada City, Cal.

Nubian.—Probably another spelling for *Nebian*—Adriatic.

Observantine—Cotignana.

Observantine—Servantine.

Observantière Grise—Cotignana.

Œil de Perdrix—Pheasant Eye.

Ome—*Figa d'Ome: Ficus richeta* Risso.—Medium or below: 1½ to 2 inches diameter: eye red, with green iris; skin violet-black; pulp bright purple-red. Nice and the Riviera.

Osborn Prolific.—Very large; about 4 inches long; rounded turbinate; tapering into a very long neck. Skin dark mahogany, gradually shading off to pale brown toward the neck, which is bright pea-green, with the surface thickly spotted with gray and white. Pulp opaline with no trace of red. A rich, sweet, and highly flavored fig. According to Hogg this fig was introduced to England by Mr. Osborn, of Fulham, in 1879. The original name is not known, as the fig has not been identified with any foreign variety.

Ovato—CARAVANCHINA NEGRA.

Pacific White.—Local name, given by Messrs. W. R. Strong & Co., of California. Medium or small; rounded turbinate; stalk very short; no neck; many shallow ribs. Skin greenish yellow, somewhat downy. Pulp coarse, amber white, with large seeds. Sweet, but poor flavor. Tree a poor grower; rounded head. Leaves small, stiff, 3-lobed, bright green, with fine down. This fig belongs to the Marseillaise class, characterized by its large seeds, but is smaller than and inferior to the true Marseillaise, which it otherwise resembles.

Pagaudière.—Two crops. Round, reddish yellow, with red streaks. A very sweet French fig for table, extensively grown in the valley of the Loire, in France, according to F. Gillet, who introduced it to this country.

Palopal.—Very large fig of white color, grown in the vicinity of Valencia, Spain.

Panachée—*Striped.*—Medium; round; skin bright, dark green, striped yellow. Pulp white. A very handsome striped fig, probably the same as Jasper, with the description of which it agrees. Leaves and stems of these figs are distinctly striped.

Panachée—COL DI SIGNORA PANACHÉE.

Paradise Fig—PARADISO.

Paradiso—*Paradise Fig.*—Only first crop said to be valuable.

Parker's Smyrna—ADRIATIC.

Pasquale—NATALINO.

Pastellière—*Pastidière.*—Size, about 3 inches long by 1½ inches wide; shape, elongated pyriform, with long, gradually tapering neck; cheeks swollen and protruding; stalk short or medium; ribs hardly elevated, and in ripe figs not distinct. Eye closed, but rather prominent, with an elevated iris, rough; scales few, but comparatively large, dark violet, with rosy margins. Bloom can not be rubbed off. Skin rather rough, hairy, covered with a thick, fine, pearl-blue bloom, extending to the eye. Color dark violet-blue all over; pulp dark red, sweet and good; meat white. A good fig for preserves. Does well at Niles, Cal. Tree erect, with stiff limbs. Leaves very large, almost circular, coarse and flat, shallow, 3-lobed or entire. If the writer could plant only one blue variety it would certainly be this fig. The fine form of the tree, its abundant cropping, and the superior quality of the fruit should make this fig a favorite all over the Pacific coast. (Fig. 78.)

Pastidière—PASTELLIÈRE.

Peau d'Ane—PEAU DURE.

Peau d'Ane Noire.—A variety of the following, with blackish-violet skin. Very fertile.

Peau Dure—*Peldure; Verte Brune; Peau d'Ane.*—Medium or above medium; 3 by 1¾ inches; pyriform, with short neck, well set; tapering; stalk short; ribs very distinct, rough, uneven; cheeks lopsided, swollen; skin green, with brown tint, turning obscure. Pulp bright rose, coarse, but good. Leaves small, 3-lobed, with very slender stalks.

Peconjude Grise—PECONJUDO.

Peconjudo—*Peconjano; Pedonculée; Ficus longicaudata* Risso (Histoire de Figueières); *Peconjude Grise.*—Oblong, rounded; very narrow but long neck; color glaucous, shaded yellow-green; pulp red. Good fresh and dry. Grasse and Antibes, Provence.

Peconjano—PECONJUDO.

Pedonculée—PECONJUDO.

Peldure—PEAU DURE.

Peloua—*Pelouas* (Provence); *Cortice Crasso; Setosa; Velvet Fig; Ficus erin.* var. *eriocarpa* Geny; *Ficus pilosa* Risso; *Velue; Perouas* N. Duhamel (probably an error for Pelouas).—Above medium; 1¼ to 1½ inches by 2 to 2¼ inches; rounded, but longer than wide; of a violet-brown color, rather intense, and with reddish shade. Skin tender, but thick, bright green, covered with a thick, whitish fuzz. Fig strongly adherent to the stem. Pulp pale yellow to pale rose: Does not suffer from coulure; produces well, and thrives equally well on dry and moist soil. Leaves 5-lobed, pointed, and crenate. This is a valuable fig, as it is a good and regular bearer.

Pelouas—PELOUA.

Pergussata—*Pregussata.*—Fruit small, round, compressed at the apex; skin purplish brown in the shade, dark brown, covered with pale spots on the side exposed to the sun; pulp deep red, rich, and luscious. August to October. (Hogg.) This is probably the true *Pergussata*, received from England under that name, in which case the fig introduced by J. Rock should bear another name. (Figs. 79, 80.)

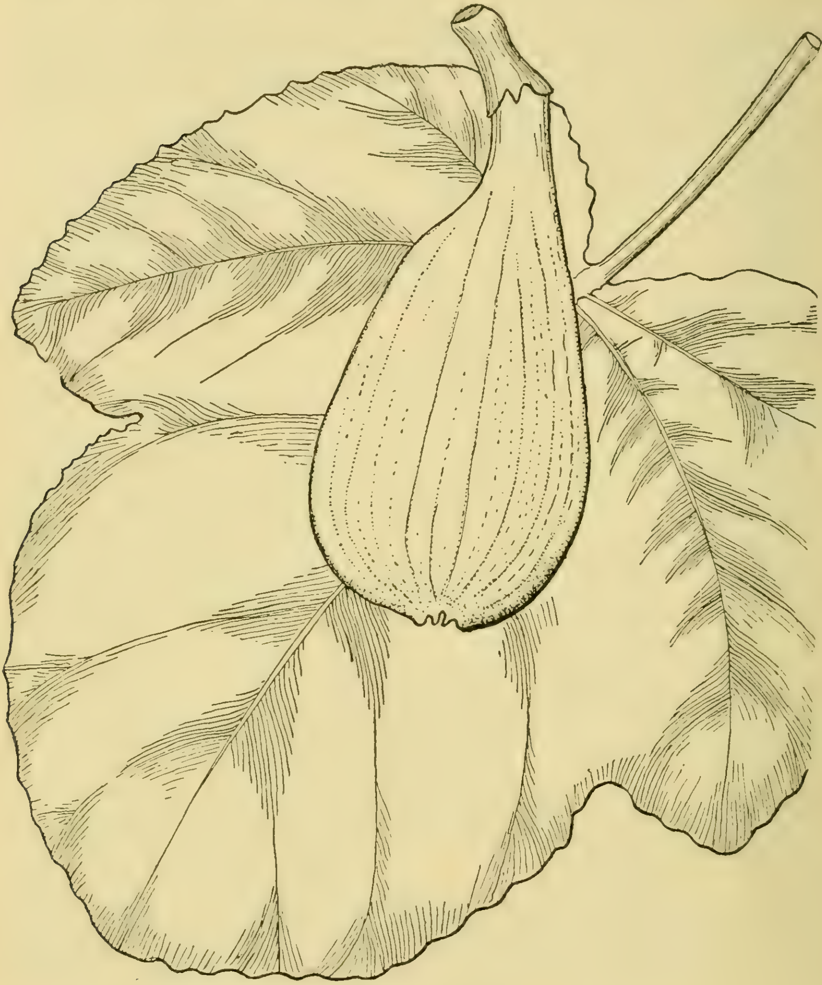


FIG. 78.—Pastellière fig.

Pergussata.—Size 3½ by 1¾ inches; pyriform; lopsided; neck long, but narrow; stalk rather long, one-half inch. Ribs broad, distinct, wavy, but not branched: eye flat, small, pale brown, with slightly elevated iris. Skin smooth or somewhat warty along the ribs, apex flat or concave. Skin pale violet-brown on cheek, lighter-shaded yellow in the shade, darker around the eye; stalk and neck greenish yellow; pulp red or rose, shaded amber. Meat under the skin greenish yellow. The name is doubtful.

Peroquina—DOUQUEIRA NEGRA.

Perroquine—PERRUQUIER.

Perruquier—DOUQUEIRA NEGRA.

Perruquier—*Perroquine; Violette Perruquier.*—Medium, oblong; stalk short; eye open; ribs obscure; skin very dark black, with white bloom; pulp deep red, stiff, and sweet, but not highly flavored. First crop 2 by 1¾ inches; leaves 5-lobed, crenate, acute. Requires dry soils. Valuable on account of its brebas, which are very fine. (Fig. 81.)

Perouas—PELOUA.

Peters White.—Size medium; flattened or turbinate; about 2¼ inches each way. No neck and stalk as a rule, though some figs have a slight neck; ribs low, bent quite distinctly around the stalk end and the eye, though nearest the latter there is a smooth zone. Skin waxy, mottled with small whitish specks, ground color green with yellowish ribs; eye large, open; scales rough, standing out, amber, tipped brown; eye flat or sunk. Cheeks rather uneven, protruding. Bloom bluish, thin; meat yellowish white, especially under the skin, but not thick. Pulp dingy pink, fine, sweet, and delicious, with a fine acid. One of the very best white figs as far as regards the first crop. Second crop, medium, pulp less pink, more amber, smaller than Adriatic, but sweeter, and never becomes sour, at least not at Atwater, Cal. A delicious fig, which the author has not been able to identify with any of the foreign kinds, though it undoubtedly comes very near to Verdone. Fully ripe fruit sent from San Joaquin Valley, California, June 26. It is probable that this, as well as "Atwater," belongs to the importations of fig varieties by the late G. N. Milco. The Peters White ripens about one week later than Atwater. Named for J. D. Peters, in whose orchard the trees were found.

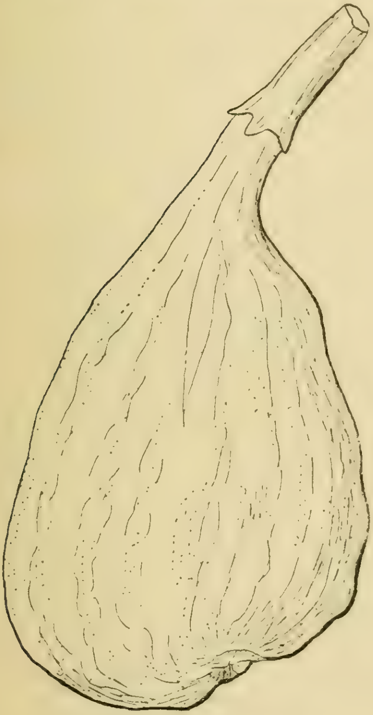


FIG. 79.—Pergussata fig.

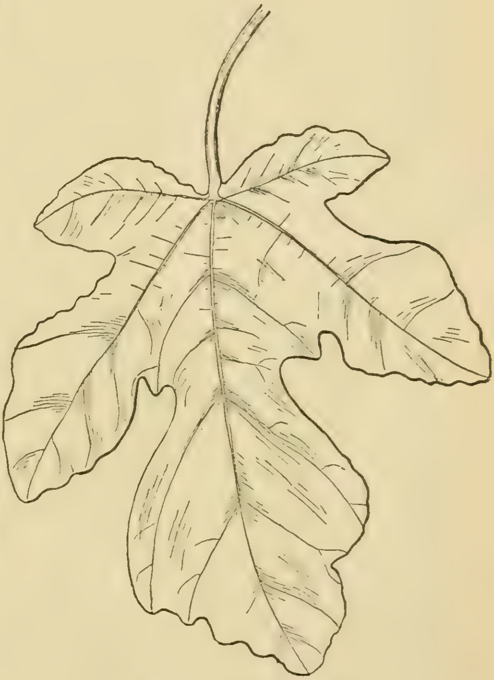


FIG. 80.—Leaf of Pergussata fig.

Petite Aubique—BORDEAUX.

Petite Aubique Violette—BORDEAUX.

Petite Blanche Ronde—LIPARI.

Petite Figue Violette—BORDEAUX.

Petite Verdale—VERDAL, ROUND.

Petite Violette—*Petite Violette des vignes.*—Small, oblong; dark violet; leaves 3-lobed. Similar to ROSE NOIRE, but smaller. May prove identical with Black Ischia, France.

Petite Violette des Vignes—PETITE VIOLETTE.

Pheasant Eye—*Œil de Perdrix.*—Medium, variable turbinate or pyriform, 2¼ inches long by 1¾ wide. Short but set neck; short or no stalk; lopsided. Eye small, closed; skin faintly ribbed, rather waxy; color deep brown, greenish on neck; pulp dull coppery amber, with a tint of salmon. A well-filled fig. Leaves below medium, coarse, 3 or 5 lobed, about 7½ by 7½ inches. This fig was received from the Royal Horticultural Society of London. It neither agrees fully with the description given by Dr. Hogg, nor does it correspond with the description given by French nurserymen.

Pichotte-Barnissotto—SAREIGNE.

Pied de Bœuf.—Size medium to large, 2½ by 1½ inches to 1¾ inches; shape oblong pyriform, with long, narrow, curved neck; stalk medium to long; skin rough, warty, with warty ribs, distinct both at apex and on neck; eye closed, small, surrounded by a rough, warty, elevated iris, of the same color as the skin, but surrounded by a lighter zone; scales large, violet; skin violet, chocolate brown, in some greenish olive in shade, with more yellow between the ribs. Thin blue bloom near the stalk. Color is diffused, apex and neck are not lighter colored; pulp amber yellow, slightly rosy; meat greenish yellow. A very good fig, remarkable on account of the color of its pulp, which is amber, while the skin is dark. The pulp, however, is quite coarse, though juicy. Tree an irregular spreading grower; leaves 3-lobed. Fruit ripens late.

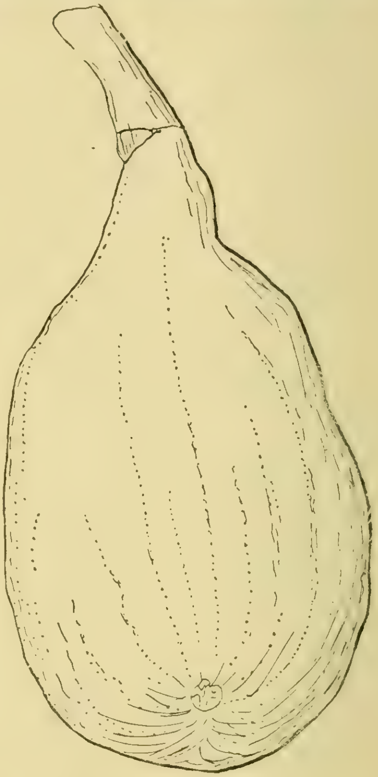


FIG. 81.—Perruquier fig.

Pignette.—A small Italian fig.

Pingo de Mel.—First crop: Above medium; largest figs are 2½ inches wide by 3 inches long, pyriform, with a short and very thin but still distinct neck. The neck is narrow; about one-fourth inch wide and even throughout; about three-fourths inch long. Greatest transverse diameter is below the center of the fig; stem short; skin smooth, waxy, pale green. Ribs indistinct, consisting of numerous lines; eye small, with large scales of amber color, margined white. Male zone distinct, but small; pulp whitish amber; male flowers around the throat and also scattered in the cavity of the receptacle, but few in number. Growth of tree sturdy, dense. Leaves medium to large, 5-lobed, rounded. Lobes rounded, deeply cut; but, as the lobes are wide and overlap each other, the sinuses between them are not very distinct. Stem of leaves as long as the leaves. This is a very good and juicy fig and one of the best green brebas. This fig variety belongs either to the class of the Cordelia fig, having male flowers with pollen, or to the class of edible caprifigs. It possesses numerous gall flowers in the cavity of the receptacle, but at this writing I have not yet found out if these galls are capable of sustaining wasps. At Niles this fig has never matured a second crop. As soon as it sets this year it will be caprificated, and it can then be determined with certainty to which class this fig belongs. At present I am inclined to consider it as an edible caprifig. (See description of this variety under Caprifig, p. 281.)

Piombinese—SAN PEDRO, BLACK.

Pissalutta—PISSALUTTO BIANCO.

Pissalutta Negra—PISSALUTTO NEGRO.

Pissalutto—PISSALUTTO BIANCO.

Pissalutto Bianco—*Pissalutta; Pittalussa; Poussouluda; Pitaluffe; Pissalutto* (Italy); *Ficus carica* var. *ligurica* Geny; *Liviana*, Pliny?—Size 1½ by 2 inches or over; medium; about one-half the weight of Dottato. Shape ovate-pyriform, the greatest width at the center. Neck medium, but very slender;

ribs very low or indistinct; eye small, scales open, bright red. Skin smooth, thin, waxy, greenish yellow in the shade, with a brownish-amber flush quite similar to that of White Bourgasotte. Meat white; pulp very lively rosy red, of the finest quality. Leaves large, 5-lobed, longer than broad, points sharp, and cuts are medium deep. The end lobe considerably longer than the other. Growth vigorous; branches quite slender and not much branched. Most leaves are 5-lobed, but some also 3-lobed; the leaf stalk is rather long. Very few, if any, brebas; second crop fair. A very fine drying fig, the best Italian fig for table, according to Gallesio, and the best next after Dottato for drying.

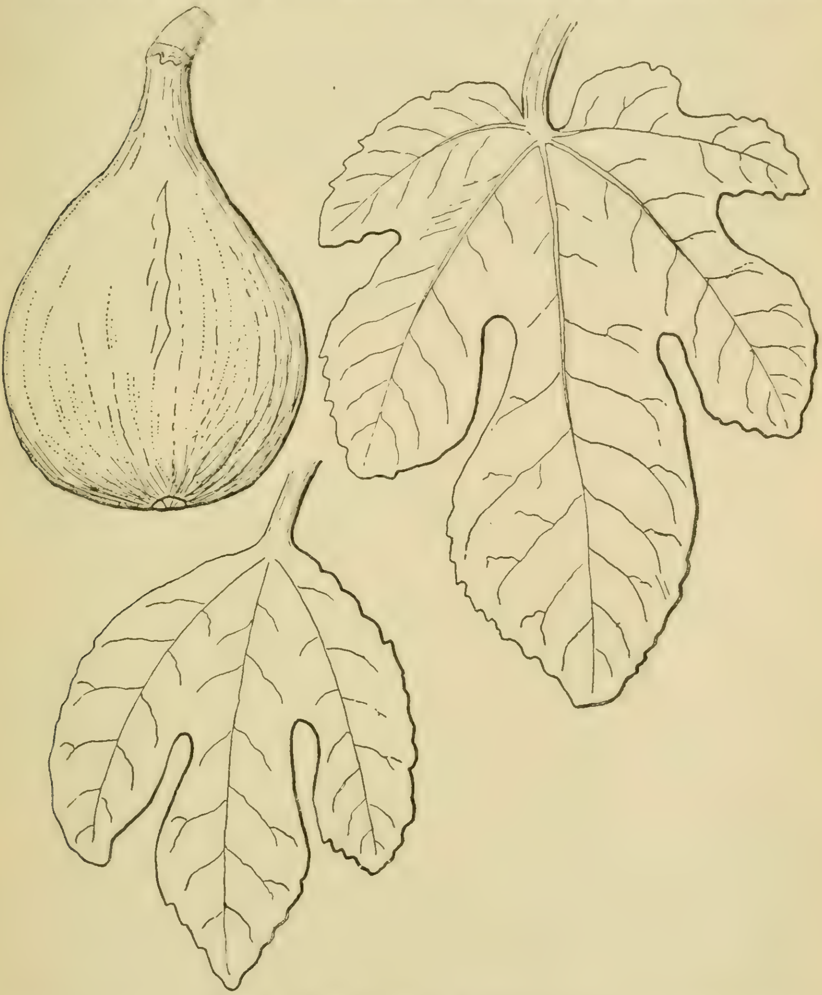


FIG. 82.—Pissalutto Bianco fig (second crop).

Common in Liguria and around Genoa, and especially fine at Sarzanese; also in Corsica and Sardinia. At Grasse, in Provence, known as *Pitaluffe*. Its period of maturity is short. It ripens after Albicello and Bineletto, and is succeeded by Dottato, Rubado, and Bourgasotte. One of the best of all figs. It is supposed to be identical with the *Liviana* of Pliny, which identification must be considered highly doubtful. (Fig. 82.)

Pissalutto Negro—*Black Pissalutto; Ficus saffrenia* Risso; *Pissalutta Negra.*—Size medium; less oblong than Pissalutto Bianco; skin shiny, violet ribbed; pulp fine and sweet. A fine black fig grown around Genoa (according to Gallesio). Inferior to Pissalutto Bianco.

Pitaluffe—Pissalutto Bianco.

Pittalussa—Pissalutto Bianco.

Pittilonga—San Pedro, Black.

Porto—*De Porto.*—A black fig, tree dwarf. For table and drying. Seyne, St. Maximin, etc., France.

Portoghese—Lampeira.

Portugal, Black (provisional name).—Largest fig known. About 4 inches wide by 5 inches long; pyriform. Short neck and very short stalk. Eye small, open, with very small black scales. Ribs narrow, indistinct. Skin otherwise smooth. Color deep violet black, greenish around the stalk end. Pulp violet strawberry red. Meat white with violet streaks. Pulp not finely grained, but very sweet and highly flavored. One of the handsomest figs grown and one to be recommended for market. Bearing quality very good from early to late. Tree a straggling grower and not dense, the limbs spreading in all directions, allowing plenty of air and sun among the branches. Leaves medium to small, oblong, with 3-pointed lobes and sometimes with 2 additional small basal lobes. This fig was brought from Portugal by emigrants to Niles, Cal., where it is now growing. The true name of the variety is unknown to me. Possibly the same as Douro.

Poulette.—First crop small; fruit medium or above medium; ovate or rounded, with short neck; stalk short; skin ashy green; pulp bright rose. Good. Second crop one-half smaller; eye closed, ashy green with gray bloom. Pulp dark red, quite juicy, and sweet. Tree medium; leaves medium, deeply 3-lobed. Good for drying; stands the rain well. Tarascon and Salon, France.

Pounchuda—*Ficus acuta* Risso; *Ficus sylvestris* var. *prælonga* Geny.—Two crops; second crop medium; 2 by 1¾ inches; oblong, gradually tapering to the stalk; neck long; skin pistachio green to yellowish; pulp reddish yellow, sweet, and honeylike in taste. Nice, France.

Poussouluda—Pissalutto Bianco.

Précoce d'Espagne—Trifero.

Pregussata—Pergussata.

Princessa—*Figa Turca; Figa Maravilla; Figa Princessa; Ficus radiata* Risso; *Ficus carica* var. *lunata* Geny; *Turca; Princess Fig; Maravilla.*—Second crop: Turbinate, rounded at apex; skin longitudinally divided in regular bands alternating green and bright yellow; eye large, raised, red; pulp bright red; good. A very handsome and fine fig. Provence and Savoy, France.

Princess Fig—Princessa.

Purple—Brown Turkey.

Purple Smyrna. (See Smyrna figs, p. 279.)

Quarteria.—Size medium, about 1¾ inches long by 2¼ inches wide, though sometimes not wider than long; turbinate or flattened like an onion. Few distinct ribs; no neck and stalk; eye small, but open; scales few and short; skin waxy, shades of green, with a fine gray bloom around the neck end, but which does not extend to the cheek, the bloom ending with a sharp margin. Eye rosy amber, with rosy iris; pulp coarse, bright but pale rose; meat amber. A good, highly flavored, and juicy fig. Fine for drying. Tree strong; round head with very dense leaves closely set on limbs. Leaves oblong, about 9 inches long by 7 inches wide, rather deeply 3-lobed, sometimes entire.

Quasse Blanche.—A reddish-gray fig, cultivated at Baudal and Seyne, France.

Quotidienne—Datte Quotidienne.

Rabbit Blood—Sang de Lièvre.

Raby Castle.—Fruit about medium or below medium; rounded, obtuse and flattened at apex; no neck, but long stalk; eye small; skin coarse, with very prominent ribs which are rather irregular; color greenish white; no bloom; pulp coarse with a few very large seed; color, white amber; sweet, but no flavor. A poor grower. Leaves small, thick, 3 to 5 lobes, and rough, with very long stalks, which are often considerably larger than the leaf. Belongs to the Marseillaise group, but is much inferior. Dr. Hogg is in error in classing this fig as a synonym of the Marseillaise. It is much coarser, with heavier ribs and with a white pulp, and the tree is less densely covered with leaves. In the interior of California Raby Castle is an inferior fig. In the vicinity of San Francisco Bay it is sweeter, but still always very coarse, and the author thinks it is not worthy of cultivation in this country, where so many better figs are grown. (Fig. 83.)

Raby Castle.—Below medium, turbinate, about 1¾ inches wide by 1½ inches long. No neck and short stalk. Flattened at apex. Many shallow ribs. Tree moderate grower with rounded head. Leaves deeply 3-lobed. This fig resembles greatly the Pacific White and may be identical with that fig. Name doubtful.

Ragusa—*Dalmatian; Dalmatian Ragusaine; Ragusaine.*—A white fig of fair quality, introduced from Dalmatia to France. Probably the same fig as introduced by G. N. Milco to California under the name Dalmatian.

Ragusaine—RAGUSA.

Recousse Noire—*Ecousse Noire?*—Large, roundish-oblate, with long neck, and with lopsided swollen cheek on one side. Ribs obscure; stalk very short; eye closed; skin violet-dark mahogany or chestnut, pale toward the neck and greenish toward the stalk end; pulp opaline with a shade of rose in center. Tender and juicy, but not flavored. Medium quality (Hogg). A very good late fig.

Recousse Violette.—Similar to Recousse Noire, but with deep red pulp.

Reculver.—Is said to be different from *Grosse Violette de Bordeaux*, SAN PEDRO, BLACK, from which it differs by being smaller and more round. It also resembles *Black Provence.*—MARSEILLAISE, BLACK. It was originally found growing wild on an old wall in the village of Reculver, in Kent, England. Fruit small, roundish; skin black; pulp red, thick, but not rich (Barron).

Reculver.—Medium; about 2½ inches long by 1¾ inches wide; pyriform, tapering; lopsided cheeks; short narrow neck; no stalk. Low, branching ribs, distinct from stalk to the eye. Eye small, closed or open, with small, rosy-colored scales. Skin slightly hairy, of a brownish violet, covered with a faint gray bloom. Pulp thick, amber-salmon, lightest at eye, turning salmon towards the stalk end. A good fig. Leaves about 9 inches by 3, deep, broad lobes and two shallow spurs. Not identical with Black Marseillaise, as suggested by Dr. Hogg. There are two distinct figs known as Reculver. The author has not seen the variety mentioned by Barron.

Reculver?—MARSEILAISE, BLACK.

Red—BRUNSWICK.

Red-Black—ROSE NOIRE.

Red Caiana.—CAIANA.

Red Frette—ROUGE DE LA FRETTE.

Rocardi.—Small; about 1¾ inches long by 1¼ inches wide; pyriform, with small neck; stalk very short. Eye small, sunk; scales large, with rough iris. Skin smooth, with indistinct ribs. Color of skin violet-purple, with fine, gray bloom extending all over the fig, or with dark violet flush. Pulp sweet, amber or reddish amber, with different shades. Meat thin, white. Pulp solid. Tree a moderate grower. Leaves 3-lobed.

Rock Fig—NEGRETTA.

Rolandina—*Briasca* (Grasse); *Rolandine; Blanchette; Fico Dattero; Ficus vezzoso; Cortese* (eastern Riviera); *Coasco* (western Riviera); *Ficus rolandina* Risso; *Ficus sylvestris* var. *praedulcis* Geny.—One crop. Size medium; 2½ inches long by 1¾ inches wide; short, pyriform or bell-shaped; skin yellowish green mixed with red and violet. Eye reddish; pulp yellowish white, tinted rose, very sweet and thick, with small seed, highly flavored. Tree medium, with deeply-cut and pointed lobes. Together with Bellona, the Rolandina is one of the very best figs cultivated in the south of France for drying. It is extensively grown there and the object of much trade. Fresh it is of medium quality only. Principally grown in the south of Provence.

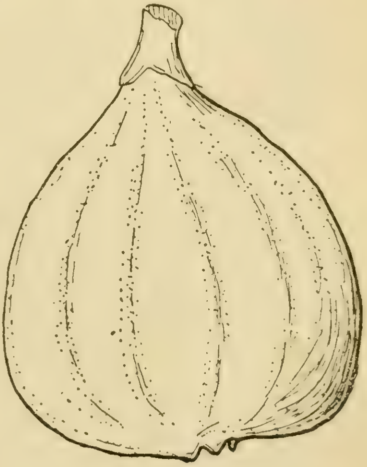


FIG. 83.—Raby Castle fig.

Rolandina Negra—*Rolandine Noire; Ficus rosa nigra* Risso; *Ficus sylvestris* var. *rubricaulis* Geny.—A variety of the reddish-gray Rolandina, more oblong turbinate, dark violet reddish, with red pulp. Provence, France.

Rolandine—ROLANDINA.

Rolandine Noire—ROLANDINA NEGRA.

Rondella Blanca—*White Rondella; Ficus helena* Risso.—Similar to the Black Rondella, but with thinner skin and of a yellowish green color. Mentone-on-the-Riviera, France.

Rondella Negra—*Black Rondella*; *Ficus sylvestris* var. *ceresana* Geny (Sanvaigo).—Below medium; 1¾ to 2 inches diameter; turbinate; suddenly contracted at the neck, which is long; eye red, with violet iris; skin blackish violet; pulp red. Around Mentone-on-the-Riviera.

Rondeletta—*Ficus carica* var. *rotundula* Geny. S.—Globular; bright green shaded brown; 1¼ to 1¾ inches diameter. Pulp red. Savoy at Nice.

Ronde Noire—*Round Black.*—Size large, about 2¼ by 2 inches; quite round, irregular; neck distinct but very short, well set; ribs distinct, running together and hardly elevated; eye small; scales very small, reddish; iris large, paler, not elevated, but still distinct, with a margin around the scales. Skin smooth, waxy, color dark violet-brown, very evenly diffused, and in the shade hardly paler, only near the stalk more greenish. Bloom thick, bluish white; pulp amber, meat amber. A very fine fig, which can not be too highly recommended as a table fig. Entirely distinct from Osborn Prolific. (Figs. 84, 85.)

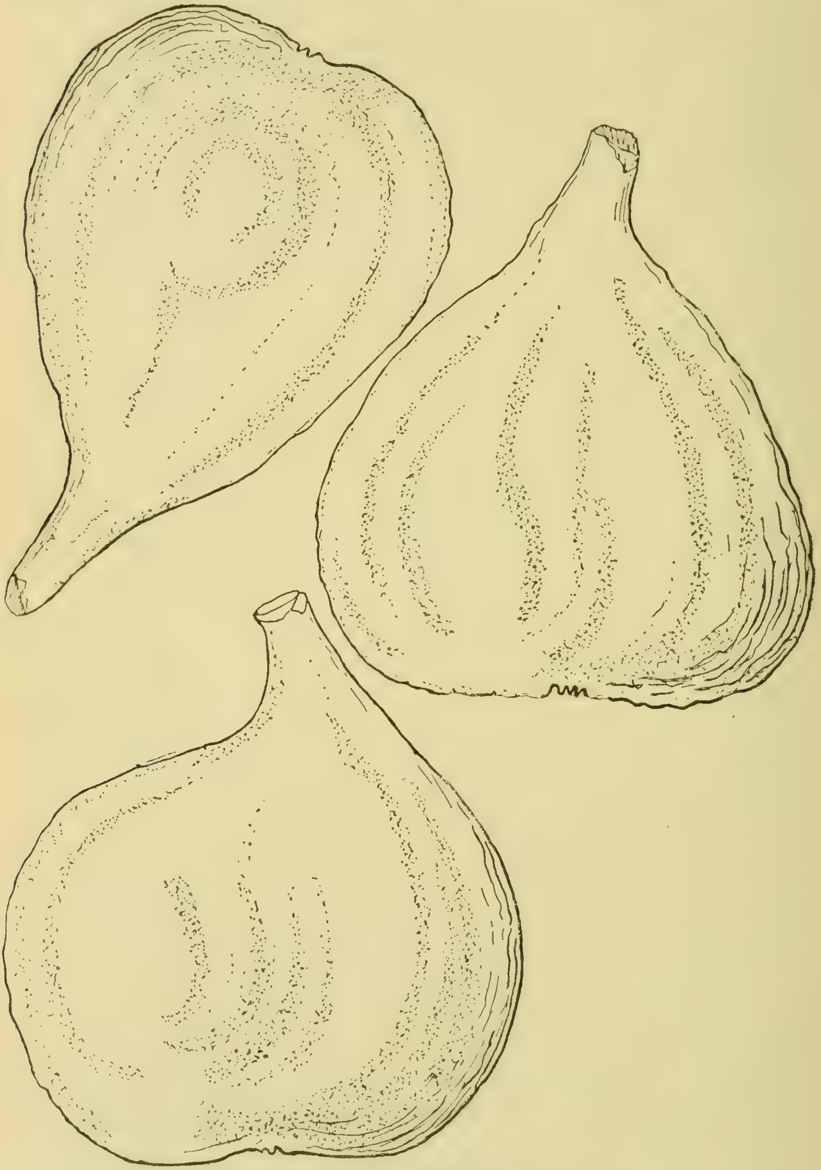


FIG. 84.—Ronde Noire figs.

Ronde Rouge.—Medium; color of skin dull, tawny red; pulp dull red. Second crop of good quality. (Barron.)

Ronde Violette Hâtive.—First crop: Large, 2⅞ inches long by 2¾ wide; almost globular, with no neck and no stalk; ribs large and prominent; skin smooth, glossy; color green, the ribs shaded violet brown, numerous very small white specks all over the skin; eye large, but not protruding, wide open with small scales of an amber-rosy color; pulp amber, shaded rose in center; meat whitish. A magnificent looking breba of first quality. Brebas ripe at Niles August 1.

Rose Blanche—*White Rose; La Rousse.*—Very large, round, depressed or flattened at the apex. Stalk long; color brownish on white ground; pulp lively red; leaves crenate, 7-lobed, with pointed lobes. Requires dry soils. South of France.

Rose Noire—*Red-Black; Cou de Muelo.*—Size medium, pyriform, contracted at the middle; skin reddish violet; pulp white amber; leaves crenate, 7-lobed, with pointed lobes. Requires dry soils. One of the better figs in Provence. Hogg erroneously gives as synonym Black Ischia, which is a much smaller fig. (Fig. 86.)

Rose Peyronne. — Medium; roundish oval; obscure ribs; stalk one-fourth inch long; skin pale brown with fine gray bloom; pulp pale salmon of good quality.

Rose White—Rose Blanche.

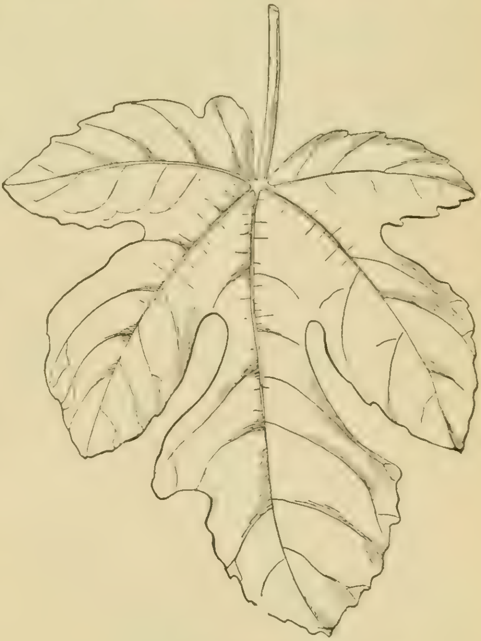


FIG. 85.—Leaf of Ronde Noire fig.

Rosine.—Said to be a white, round fig from Syria. Good for drying.

Rosso di Mensiglia.—Italy.

Rotondo Levigato.—Italy.

Round, White Smyrna. (See Smyrna figs, p. 279.)

Rouge de la Frette—*Frette; Red Frette.*—Large; oblong; pyriform; skin red. Late. Grown around Frette, near Paris, France.

Rougette.—Small; obovate; without ribs; stalk short; eye closed; skin red, coppery yellow in shade, shading to yellow toward stalk end. Pulp coppery red, of indifferent quality. (Hogg.)

Round Black—Ronde Noire.

Round Verdal—Verdal, Round.

Round White—Blanche Ronde.

Roussana—*Ficus sylvestris* var. *rubella* Geny.—Second crop: medium, 1¾ to 2 inches diameter; color pale reddish-violet with red pulp. Nice and its vicinity.

Royal—Versailles.

Royal de Versailles—Versailles.

Royal Vineyard.—Fruit above medium or medium long; pyriform, with long slender neck and long slender stalk; ribs mere longitudinal lines. Eye large, open; skin thin, hairy, reddish brown or purple, with thick blue bloom; pulp bright reddish, hollow in center, but otherwise juicy and good and highly flavored. The true name was not known when the variety was introduced into England. (Fig. 87.)

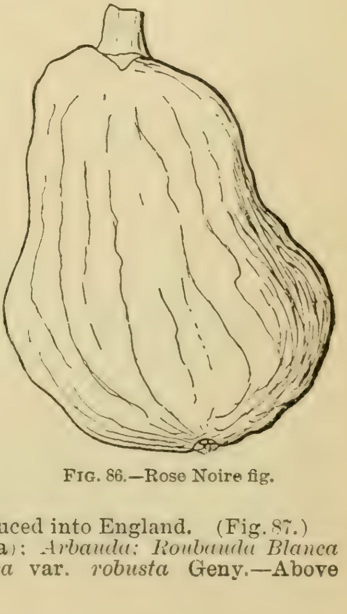


FIG. 86.—Rose Noire fig.

Rubado—*Cuore; Rubaldo; Figa Rubado* (Genoa); *Arbauda; Roubauda Blanca* (Nice); *Ficus richardi* Risso; *Ficus carica* var. *robusta* Geny.—Above medium, about 2¼ by 1¾ inches, bell-shaped to turbinate or heart-shaped; greatest diameter at center, gradually tapering toward the stalk, which is of medium size. Skin thick, smooth, of green color, shaded reddish brown and yellow in the sun, and with ashy gray in the shade, adhering strongly to the meat. Pulp intensely red, very sweet and flavored, with a drop of honey exuding at the eye, rather sharp in taste; eye reddish; leaves small, 3-lobed, and not deeply cut; branches few and slender and tree of small growth to medium. The first crop very small or none The second crop larger, ripe in September and November. One of the best Italian figs for the table. Extensively cultivated in northern Italy and Provence, but especially so in the Marche, Umbria, Sabina, Piedmont, Appenines, Lombardy, and Romagna. In many places known as *Fico Cuore*, on account of its heart-like shape. Is to be highly recommended. (Fig. 88.)

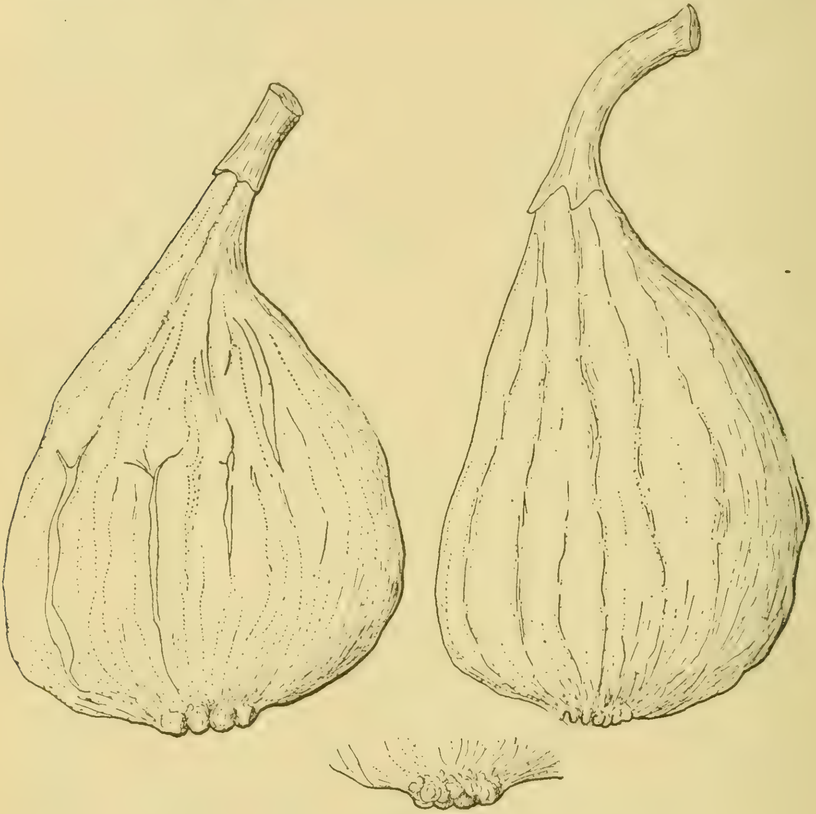


FIG. 87.—Royal Vineyard figs.

Rubado Negro—*Ficus serotina* Risso; *Ficus sylvestris* var. *hyberna* Geny; *Roubauda Negra* (Nice).—Size 2 to 2½ inches diameter; turbinate; violet red or fine black; eye red with a large reddish-brown iris; skin hard; pulp bright red, thick, agreeable. November. One of the latest figs. Nice, Italy, etc.

Roubauda Blanca—RUBADO.

Roubauda Negra—RUBADO NEGRO.

Rubaldo—RUBADO.

Rubicone—SAN PEDRO, BLACK.

Safranée.—Reddish gray. Nice and Salon, France.

Saint Dominique—DOMINIQUE.

Saint Esprit.—Large, oblong; color dark violet. Resembles Aubique Noire but is inferior in taste. Provence and near Ponte St. Esprit in Languedoc, as well as at Aix and Salon. A good early crop; second crop poor.

Saint Francis—FRANCISCANA.

Saint Jean—*De Saint Jean.*—Very large; two crops. France.

Saint John.—First crop: above medium, 2¼ inches long by 2 inches wide: pyriform; stalk medium, longer than the neck, which is not well set: skin smooth, waxy: ribs few, irregular, skin yellowish green, with numerous light specks of unequal size, eye small, closed, with warty iris of the same color as the fig: scales about six, large, pale dingy white: pulp and flesh white with small seed. Leaves medium, 5-lobed; end lobe the largest: lobes rounded, deeply cut; stalks long. A very sweet and juicy breba, ripe at Niles August 1.

Saint Johns.—Possibly the same as Saint Jean.

Saint Peter—SAN PEDRO, WHITE.

Saint Ursula d'Avignon.—Below medium: oblong, without neck: stalk short; eye open; ribs very obscure: skin pale brown or copper, paler on the stalk, where it is tinged green: pulp tender, pale rose in center, opaline toward the meat and skin. A small but very delicious fig. (Hogg.)

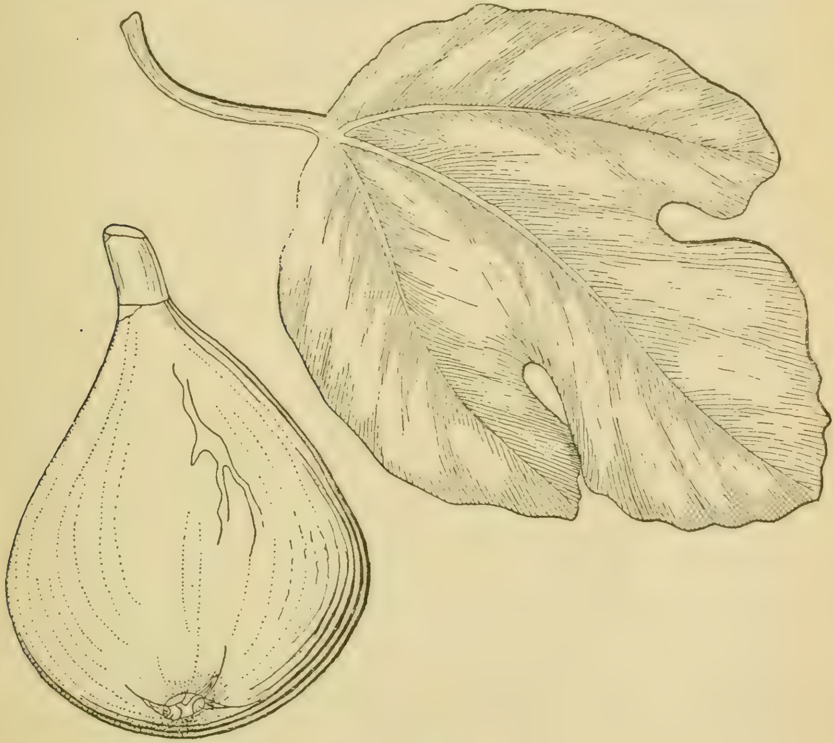


FIG. 88.—Rubado fig.

Salada—*Ficus purpureo-violacea* Risso (S).—Two crops: second crop pyriform: 2⅓ inches long by 1⅝ inches wide, quickly contracted at the neck: color purple violet or pale purple; pulp reddish brown. Nice and the Riviera.

Salerne.—Above medium to large: 2¼ inches diameter: globular: stalk and neck short; eye very open; skin whitish yellow. A hardy fig, not subject to dropping or injury by rain. A very early variety, requiring dry and high ground. Provence.

Salette—Provence.

San Francé—FRANCISCANA.

San Pedro—SAN PEDRO, WHITE.

San Pedro, Black—*Aubique: Black San Pedro; Corbo* (Pescia); *Piombinese* (Pisa and Collina); *Rubicone* (Carrara and Sarzana); *Arbicone* (Genoa); *Fico Nero* (Sardegna); *Pittilonga; Minna* (Sicily); *Minna di Schiavo; Fallagiana* (Abruzzo); *Aubique Noire* (Provence); *Breba Negra* (Spain); *Aubique Violette* (Provence); *Violette Longue?* (France): *Aubiquon* (Provence); *Auliguo; Grosse Violette Longue; Figue Poire; Fico Arbicone* (Genoa); *Fico San Piero* (Toscana); *Fico violacea* Risso; *Ficus erin.* var. *uberrima* Geny; *Negro Largo; Noire de Languedoc; Grosse Rouge de Bordeaux; Grosse Violette de Bordeaux; Nero Oblungo.*—Dr. Hogg, in his catalogue, confounds this fig with Violette de Bordeaux and *Petite Aubique*, Bordeaux, which are different figs of smaller size and of pale-grayish color, for description of which see "Bordeaux." On the other hand, the author is satisfied that Dr. Hogg's Negro Largo and Noire de Languedoc are identical with the Black San Pedro, although this is not quite clear from his description of the variety.

Two crops. First crop very large, from 3½ by 2 inches or 4 by 2 inches. Shape elongated, ovate; no ribs; with prominent and well-set neck. No, or very short, stalk, flattened laterally and rather lopsided, one side of apex hanging down more than the other. Eye open, reddish; skin smooth, violet black, with a rosy flush in the shade and green on the neck; fine blue bloom; pulp coppery red, tinted with violet; very sweet, but with a light disagreeable smell and bitterness. Second crop smaller, oblong, 2½ by 1½ inches; ribs many and prominent; color deep sea green, with violet-black ribs; eye medium, with many spreading yellow scales; pulp reddish violet, rather coarse; meat thick, greenish white. Tree very strong grower, requires moist and rich soil. Leaves large, 3-lobed, forming a very dense foliage. The first crop is a table fig of unsurpassed size and fair quality. The second crop dries well, but is small in quantity and inferior in quality compared to the first crop.

The Black San Pedro is one of the most excellent of the black figs. It is cultivated extensively in northern Italy, Provence, and Spain. It thrives also in the vicinity of Paris. The author has seen figs of large size and fair quality near Santa Ana, Cal. In size it is probably unsurpassed by any other black fig known. Though the fig is called San Pedro, Black, it must not be understood that it is a variety of the San Pedro, White, or vice versa. The two figs do not resemble each other in the least, and are, in fact, not related, and the only thing they have in common is the name. Under the name of Grosse Violette de Bordeaux the author received from Rev. Dr. Wilks a fig distinct from either Bordeaux or San Pedro, Black. It resembles somewhat Negrone, but has smaller leaves. (See Violette de Bordeaux.) (Fig. 89.)

San Pedro, White—*Fico di San Piero; Fico di San Pietro; Apple Fig; Breba* (erroneously); *Saint Peter; White Saint Peter; Fico di Saint Piere; San Pedro.*—Two crops, the first only maturing without caprification. Large, rounded; 3 to 4 inches diameter, somewhat flattened at apex; stalk and neck very short; eye large, open, but not protruding. Skin ribbed, not waxy, thick, but tender, of a bright yellow color in sun, shading to greener in shade, with no bloom, but showing off like a lemon on the tree. Color of scales yellow, with violet iris; pulp light amber, opaline, with here and there a trace of red; rather coarse but sweet, and somewhat deficient in flavor. A remarkably handsome fig, but difficult to ship any distance. Large growing tree, with upright branches; leaves waxy and not deeply lobed, with obtuse points. Requires deep, rich, moist, but not wet, river-bottom soil. Only the first crop comes to maturity without caprification. Is not related to Black San Pedro.

Second crop: Fig as large or larger than the first crop; about 2⅝ inches wide by 2 inches long, being decidedly flattened, like an onion. The eye is large and wide open, with amber scales of small size, of a spreading nature. No stalk and no neck. Many ribs from eye to stalk distinct all around. Color of skin deep sea green, without any flush of yellow in the sun. Flesh, deep and bright strawberry red, without any violet tint. Meat, yellowish white. Seed, many, but very small. Pulp, fine, juicy, and highly flavored and distinctly acid. A most exquisite fig and much superior to the first crop, which often is insipid. This crop was produced at Niles on a properly caprificated San Pedro fig tree standing next to a capri Milco. It bears a full second crop, while all other San Pedros, which had not been caprificated, dropped all their second crop, just as they had done for ten or more years past. It is interesting to note that the second crop differs from the first crop in shape and quality. Caprificated, I consider San Pedro, White as one of the most delicious figs I have seen. It may possibly prove to be a valuable fig not only for the market but also for drying.

San Pedro, White, is rather extensively distributed in California, especially in San Joaquin Valley. When well grown it is a very good fig, which, when near a market, sells well. It was introduced to California at various times, once under the name of *Breba*, from Spain.

Sang de Lièvre—*Rabbit Blood.*—Large, rounded; skin bright brown; pulp blood red. Good bearer and fair quality for table.

Saracène—Saraïna.

Saraïna—*Sarasina, Saracène; Ficus saracenica* Risso: *Ficus erin.* var. *erodens* Geny.—Medium, about 2 to 2½ inches diameter: oblong turbinate: skin thick and hard, cracking, bitter, adhering to the pulp, which is red. Color of skin blackish violet: stalk of the fig easily detached from the branch upon which it grows. Nice and Provence.

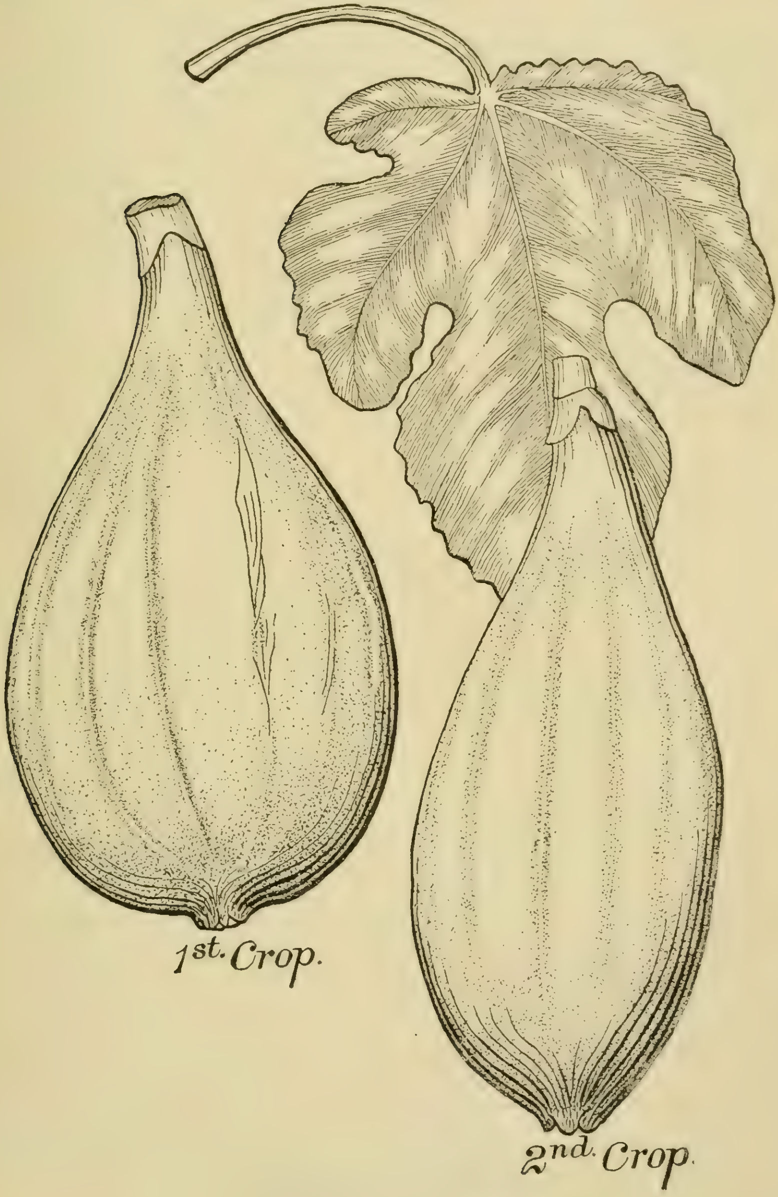

1st. Crop.
2nd. Crop.

FIG. 89.—San Pedro, Black figs.

Sarasina—SARAÏNA.

Sareigne—*Verdale; Pichotte-Barnissoto.*—About 2 inches diameter: round, neck very short, strongly adhering to the branch and not separating even when ripe. Skin thick, of a very dark, violet black, greenish at the neck.

Pulp red. Good, but requires great heat and moist and rich soils. Leaves 3-lobed, undulating margins with obtuse lobes. Common in Provence. Recommended for the warm valleys of California and Arizona.

Sarnese.—France.

Savantine—SERVANTINE, CORDELLIÈRE.

Seirola—*Seyrole; Seirolles*, Duhamel?; *Ficus seirola* Risso; *Ficus carica* var. *leiocarpa*, Geny.—Medium or small; second crop turbinate; 1¾ to 2 inches; skin greenish-yellow; eye prominent, green; pulp yellow, very sweet, dries well. Savoy and Provence around Nice, Grasse, and Draguignan.

Seirolles—SEIROLA.

Servantine—*Serventine; Observantine; Cordellière; Savantine.*—First crop, large, round, with prominent ribs; second crop, half size. Color pale yellow; pulp red. A good fig, which requires moist, rich soil. (Fig. 90.)

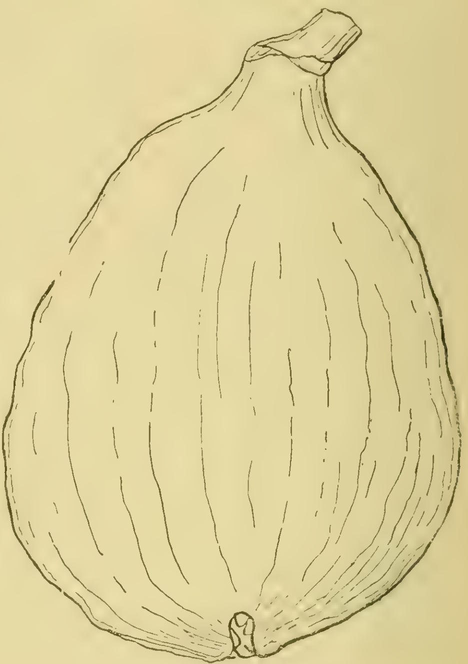


FIG. 90.—Servantine fig.

Servantine d'Argenteuil—A variety of Servantine, with greenish red skin. Very large, round. Fertile and early. Grown around Argenteuil.

Servantine Grise—*Gray Servantine.*—A variety of the Servantine, but not identical with the Servantine Bifère.

Servantine Bifère—*Grise Servantine Bifère; Toulousienne.*—Probably the same as Toulousienne, but not the same as Servantine. Below medium, short, pyriform; skin dull brown, ribbed, with a thick, gray bloom; flesh dull red, thick, sirupy, and luscious.

Servantine Rouge.—A variety of the preceding with red skin. Large, round. Said to be fertile and good.

Serventine—SERVANTINE.

Setosa—PELOUA.

Sextius.—A white fig of good quality from Aix, France.

Seyrole—SEIROLA.

Seyroles.—For drying. At Grasse and Draguignan.

Siciliana—*Figa Siciliana* (Nice); *Ficus siciliana* Risso; *Ficus sylvestris* var. *bruttia* Geny.—First crop above medium; 3¼ inches long by 2½ wide; oblong, rounded at apex; color greenish-yellow, with grayish spots. Eye very large, raised, reddish; meat violet; pulp yellowish and pale red. Nice and vicinity.

Singleton—ISCHIA, WHITE.

Small Black.

Small Brown—MALTA.

Small Early White—EARLY WHITE.

Small Purple Smyrna. (See Smyrna figs, p. 279.)

Small Verdal—VERDAL, ROUND.

Smyrna. (See Smyrna figs, p. 279.)

Smyrna, Black—PURPLE SMYRNA. (See Smyrna figs, p. 279.)

Smyrna, Maple-leaved—MAPLE-LEAVED SMYRNA. (See Smyrna figs, p. 279.)

Smyrna, Round White—ROUND, WHITE SMYRNA. (See Smyrna figs, p. 279.)

Smyrna, Small Purple—SMALL PURPLE SMYRNA. (See Smyrna figs, p. 279.)

Strawberry Fig—ADRIATIC.

Striped—PANACHÉE.

Striped Signora—COL DI SIGNORA PANACHÉE.

Sucrada—*La Sucrada; Sugar Fig. Ficus saccharata* Risso; *Ficus carica* var. *formosa* Geny.—Two crops. First crop, pyriform; greenish-yellow, flushed brown on the ribs. Second crop, turbinate; 2 to 2½ inches; rounded, ribbed; color greenish, bright yellow toward apex; pulp, pale red, very sweet. A very distinct fig.

Sugar Fig—SUCRADA.

Sulane.—Oblong, white. France.

Sweet Briasca—BRIASCA DOUSSA.

Sweet Brayasque—BRIASCA DOUSSA.

Tapa Cantin—TAPA CARTIN.

Tapa Cartin—*Aubico Blanco; Aubique Blanche; Grosse Jaune; Tapa Cantin; Bouche Barrique; Ficus monstruosa* Risso: *Ficus carica* var. *prolifera* Geny.—A very large fig. and one of the largest white figs known. Size. 3 to 4 inches long by 2 and 2½ inches wide. Shape oblong. often contracted at the middle, and rather irregular as to outline; neck thin, long; skin very thin, yellow; eye large, open; pulp bright blood red. with numerous seeds. This fig frequently develops a monstrosity—another receptacle cropping out of the apex of the first one, just as a rose is often found protruding from the center of another rose. Leaves, 5-lobed, with undulating margins and obtuse lobes. Requires moist soils. Cultivated around Nice, Provence, France, and in other places. (See also Merioun.)

Tapa Cartin Negre.—A black variety of the preceding, with lustrous black skin.

Thâmeriouth.—A white fig from Kabylia.

Thabellout.—A white fig from Kabylia.

Thaberkant.—A black fig from Kabylia.

Thabouhiaboult.—A black fig from Kabylia which dries with difficulty.

Thabouhiaboult.—A white fig from Kabylia. Is dried and cured with some difficulty.

Thadhefouith.—A white fig from Kabylia. Does not require caprification.

Thadoukkarth-en-thara'animt.—A variety of caprifig from Kabylia.

Thadoukkarth-en-tifouzal.—A variety of caprifig from Kabylia. The best variety.

Thadoukkart-en-t'it-en-tesekkourth.—A variety of caprifig from Kabylia. The name means "pheasant's eye."

Thadoukkart guir'zer.—A wild caprifig from Kabylia. It is not used for caprification. but only as stock for grafting. The word means "the caprifig of the river bottoms."

Thadoukkarth Thaberkant.—A variety of caprifig from Kabylia. Color black.

Thakournennaïth.—A white fig from Kabylia. the name meaning "round."

Thamellalt.—A white fig from Kabylia.

Thaoussifth.—A white fig from Kabylia.

Thar'elit.—A white fig from Kabylia.

Thar'animt.—The most esteemed white fig grown in Kabylia. Requires caprification in order to produce mature fruits.

Thazerart.—A white fig from Kabylia Does not require caprification.

Thazaïcht.—A black fig from Kabylia which requires caprification.

Tibourenque.—Fresh and dry; middle of September. Marseilles and Salon.

Tiburtina.—GENTILE.

Toscana—*La Toscana; Florentina; Figa Florentina; Ficus carica* var. *florentina* Geny.—Two crops. First crop pyriform, lopsided, of large size. 3¼ inches long by 2 wide. Eye prominent; skin rough, dotted, of greenish yellow, shaded gray; pulp pale yellow, streaked violet, sweet, highly flavored. Better than the Gentile. A variety of this fig with brown skin is found near Bordighera, Nice, and Provence.

Toulousienne.—Medium; about 1¾ inches wide by 2 inches long; pyriform, with flattened apex. Neck distinct. Stalk small, almost none. Ribs many, shallow, and almost imperceptible. Color of skin dingy olive-green with violet-brown flush. Pulp bright strawberry red. Meat greenish-white. Eye small, with rough iris of the same color as skin. Tree medium. Leaves small, shallow, 3-lobed. almost entire, and of rounded outline. Quality of fig good, but appearance is insignificant.

Toulousienne—SERVANTINE BIFÈRE.

Tres Fer—TRIFERO.

Tre Volte—NATALINO.

Trifère—TRIFERO.

Trifero—*Tres Fer; Précoce d'Espagne; Trifère; A Tres recolte?.*—Three crops. Small, rounded turbinate or pyriform, about 1¼ to 2 inches long by 1½ inches wide, with obscure ribs: stalk about one fourth to three-fourths inch long; no neck. Color dark green, transparent, shaded brown around the crown, paler toward the stalk; eye small, closed; pulp opaline nearest the meat, rosy toward the center. Fig is well filled. A very small, early and constantly bearing fig, rich, juicy, and of very good quality, recommended where only one tree can be grown. Leaves very small, about 5½ inches, with 3 large lobes and 2 small spurs.

Trille—*Madame Trille.*—Large, white skin. Two crops. Originated in France, or at least named there.

Trois Récoltes.—Small, ovate, skin dark, tawny copper colored; pulp dull red, with but little flavor. Early and free bearer. (Barron.)

Trojano.—A green Italian fig from the vicinity of Naples. The best table fig grown there. Has not yet matured in California.

Trompe-Chasseur—CUERS.

Trompe-Cassairè—CUERS.—Probably the same as NATALINO.

Truett.—Below medium, about 1½ inches by seven-eighths inch; shape elongated oval.

Tulpick.—Said to be a Syrian drying fig of superior quality.

Turca—PRINCESSA.

Turkey, Brown—BROWN TURKEY.

Turqui—LEVANT.

Twin Fig—MERLINGA.

Walton—BROWN TURKEY.

Varina—Italy.

Vebra.—Size medium to small, rounded turbinate, no neck and short stalk, many indistinct ribs. Eye small and closed, skin waxy, transparent, of a fine greenish-yellow color. Pulp almost pure white, faintly ambered, with small seed. A fine, juicy, refreshing fig, but not highly flavored. Tree moderate, upright. Leaves small, 3-lobed, about 4½ inches in diameter, rough, with shallow lobes. The stalk of the leaf is unusually long, sometimes twice as long as the leaf.

Velue—PELOUA.

Velvet Fig—PELOUA.

Vendome—ANGÉLIQUE JAUNE.—Local name given by Messrs. Strong & Co. (California). This fig is undoubtedly the same as ANGÉLIQUE JAUNE.

Verdal—VERDAL, LONG.

Verdala—VERDAL, LONG.

Verdala Blanca—VERDAL, WHITE.

Verdal de Valence.—Below medium, roundish, turbinate, slightly ribbed, skin dull tawny red, with a fine bloom; flesh thick, dull red. Second quality, very prolific. (Barron.) Name doubtful.

Verdal, Long—*Verdala* (Nice); *Verdale* (Provence) *Ficus virescens* Risso; *Ficus carica* var. *multiferox* Geny; *Gironetta; Grosse Verdale; Verdal Longue; Long Verdal; Verdal.*—One crop, September. Size medium, about 2½ by 1½ inches, shape oblong-turbinate; stalk and neck short, woody and hard. Eye large, closed, bright red, skin thick, with ribs of a yellowish-green color, with the ribs flushed brown, base of fig violet, no bloom. Pulp pale strawberry red, of fair or good quality. A very large spreading tree with deeply lobed leaves. Common in south of France, and also growing in a few localities in California, where it, however, has not been thoroughly tried.

Verdal Longue—VERDAL, LONG.

Verdal Ronde—VERDAL, ROUND.

Verdal, Round—*Petite Verdale; Verdal Ronde; Round Verdal; Small Verdal.*—One of the earliest of figs, ripe in June and July. Below medium or medium, about 1¼ by 1⅜ inches or larger; shape round, or slightly pyriform, without stalk or neck and with low and distinct ribs. Skin smooth and waxy, of a uniform bluish-green at the apex, gradually lighter toward the stalk end. No bloom; eye closed, small, but large in proportion to the size of the fig, with few but comparatively large scales of amber color at the point, darker rose at the base. Pulp dark blood red, very fine, sweet and highly flavored in some localities. A small but fine variety. This fig is highly praised in Santa Clara Valley, California, and around Nevada City, Cal., but is inferior in the San Joaquin Valley, California. Extensively distributed in the south of France, where it loves dry and mountainous regions. This variety is very useful for conserves and preserves, as the fig is small, very sweet, and the skin is waxy—all points favorable for the preparation of a good article of conserve and glacé fruit. (Fig. 91.)

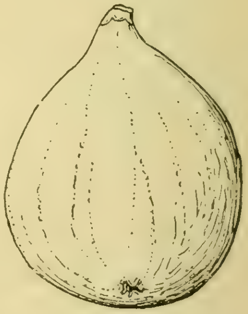


FIG. 91.—Verdal, Round fig.

Verdal, White—*Verdala Blanca; Ficus variabilis* Risso; *White Verdal.*—Almost pyriform, with a long neck, color green, changing to whitish. Size small, about 1½ inches diameter; pulp blood red, very sweet. A variety of Verdal mentioned by Risso as grown in Provence, France.

Verdale—SAREIGNE.
Verdale—VERDAL, LONG.
Verdaou—GROSSE BEURDOUA.
Verdara—CIMEIPENCA.
Verdecchij—VERDECCIO.

Verdeccio—*Verdechio* (Tanara); *Verdecchij* (Aldrou); *Verdichio* (Bologna); *Verdolino* (Piacentino).—Below medium, about 1½ by 1½ inches: shape round, swollen, uneven, depressed at apex, with no neck: stalk short; eye small, red; ribs distinct and regular; skin tender, bright green, turning yellow in sun; pulp amber white, very sweet and very fine. (Fig. 92.)

Verdeccio di Brianza—VERDINO DI BRIANZA.
Verdechio—VERDECCIO.
Verdichio—VERDECCIO.

Verdino di Brianza—*Verdeccio di Brianza.*—A green fig of good quality; Italy.

Verdolino—VERDECCIO.

Verdone.—Medium, or above medium; round: skin green; pulp red. The famous fig grown in the vicinity of Rome, claimed by W. B. West to be identical with the Adriatic, which, however, is by no means certain. As far as I know there are no trees of Mr. West's importation now alive in California.

Verdone (Rome)—ADRIATIC.

Vernissenque—*Bernissenque.*—Large, turbinate, regular; neck long: stalk short; longitudinal ribs, most distinct on the neck; eye open: skin perfectly deep black, without trace of lighter color, with a fine bloom like that of a dark plum. Pulp dark blood red, sweet, but flat. A very showy, second-rate fig with small seeds, flavored and of good quality. Leaves, 5-lobed, much serrated and crumpled, longer than broad. Only second crop; matures late in September. This fig is not identical with either Verdone of Verona and Rome, Verdini of Milan, Verdolino of Piacentio, but resembles greatly Zigerino Verde (Enganei) (G). Cultivated in Lombardy in the district of the Po. Nor is it identical with any of the Verdals, but seems to be a distinct and well-characterized fig, superior in flavor to the small round Verdal, which it somewhat resembles. The Verdal is a handsomer but not as fine a fig.

Versailles—*Abondance: Royal: Royal de Versailles.*—Two crops: first crop medium, about 2¼ inches wide by 2¾ long. Longer than broad, bell-shaped, flattened at apex, with a distinct neck; stalk medium; ribs few, well marked; color pale greenish white: pulp rose. Second crop: small with longer stalk; leaves 5-lobed, undulating with obtuse lobes. Similar to Blanche Commune, but is longer and with a more contracted neck. A coarse and poor fig when grown in English hothouses or when in an unsuitable climate. Highly recommended by French growers as one of the best figs for the table, at least in certain districts. Mr. Felix Gillet, of Nevada City, Cal., who has grown this fig extensively, writes that the skin peels off like that of an orange and that it is a very sweet fig, which stands shipment well, the first crop ripening with him about July 1, and the second crop in September. (Fig. 93.)

Verte—CUERS.

Verte Brune—*Ficus carica* var. *deceptans* Geny; *Hunter's Deception.*—Two crops; second crop, medium or small, 1¾ to 2 inches diameter: globular, compressed at the stalk and with unequal cheeks: skin cracking, bright or blackish-green, with a violet flush in the sun. Eye, reddish; pulp, blood-red, of good or fine quality. Leaves 5-lobed, crenate, with pointed lobes. Savoy and Provence, around Grasse and Toulon. There is another fig with this name. (See Cuers.) The name of the fig is derived from the fact that the fig appears unripe while in reality it is perfectly ripe.

Verte Brune—CUERS.
Verte Brune—PEAU DURE.
Verte Petite—LIPARI.

Vigasotte Bianco.—Size small, about 1½ inches round, turbinate. No neck: stalk one-half to three-fourths inch: skin rough, uneven: coarse but shallow ribs; eye small, closed: pulp white, faintly amber: seeds small, but numerous; color pale green, without fine bloom. Leaves medium to small, about 6 inches, rough, coarse, especially underneath: margins wavy.

Vigasotte Bianco—*Vigasotte.*—Small, roundish, turbinate, 1½ inches wide by 1¾ long: neck very short or none; stalk medium or none: ribs indistinct: eye very small, closed or open, scales small amber: skin smooth, cracking, very thin, transparent, with very thin bloom: pulp amber, with few seeds: meat white. A juicy and good little fig, but it is not highly flavored. Tree a moderate grower. Leaves small, with long stalks, 3 to 5 lobed, the two upper lobes being very small. Under this name there are two distinct figs sent out.

Vigasotte—VIGASOTTE BIANCO.

Violette de Bordeaux.—Small, 2 inches long by 1½ inch, pyriform, tapering; no distinct neck, but with long stalk, which is bent over. A few shallow ribs, especially distinct on neck above cheeks; eye very small, closed; scales yellow; skin rugose, slightly downy, of a violet-black color, with a distinct and fine

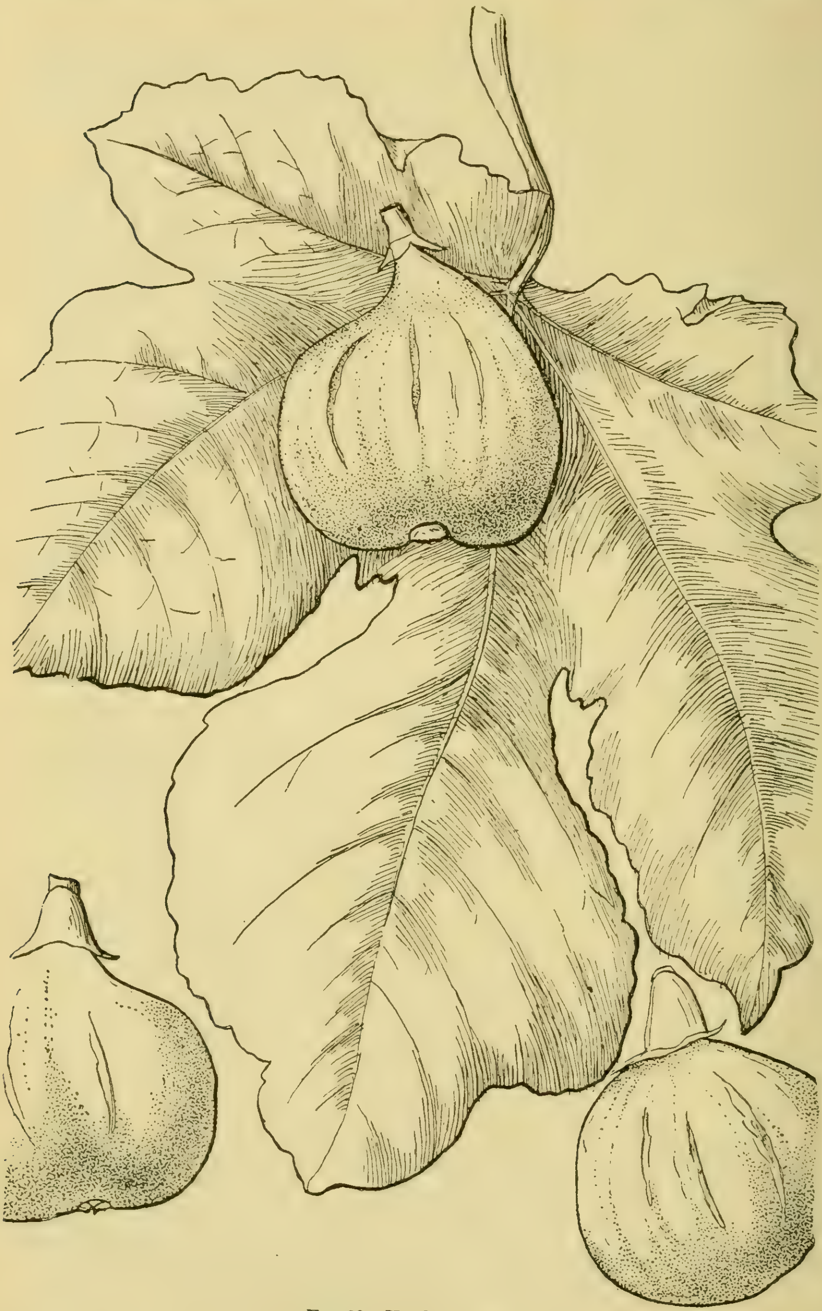


FIG. 92.—Verdeccio figs.

blue bloom, confined to the neck, ending sharply halfway to the equatorial. Pulp fine, dense, brownish salmon; meat violet-white not rich; leaves from 5 to 7 inches long, 3 deep, narrow lobes outside of spurs. Very similar to Negrone, but has smaller leaves.

Violette de la Frette—*De la Frette: Figuier Rouge.*—Medium, oblong, somewhat flattened; skin reddish brown, with violet flesh; color of pulp rose. Grown at Frette for the Paris market.

Violette Longue?—SAN PEDRO, BLACK.

Violette Perruquier—PERRUQUIER.

Violette Sepor.

Walton—BROWN TURKEY.

Warren's Brown Turkey—WARREN.

Warren—*Warren's Brown Turkey.*—First crop: very large, turbinate, about 5 inches long by 2½ inches wide. Neck long, tapering; stalk very short: ribs narrow, numerous, and shallow. Eye large, with many prominent and expanding scales of a brownish yellow color. Pulp coarse but sweet and juicy, solid; meat narrow and thin. Color of skin greenish on neck, violet at apex and along the sides. Color of pulp and meat rosy amber, with violet streaks and spots. One of the best brebas known in California. Leaves large, with three shallow lobes.

This fig is different from the true Brown Turkey and quite distinct from the Brunswick, which it also resembles. In fact it resembles more the Brunswick than the former. The true name of this fig is not known. Introduced or at least distributed by Colonel Warren in the early days of fruit culture in California. Possibly identical with San Pedro, Black. Tree a strong grower and heavy bearer. Grown in Vacaville, Cal., under the name of Brown Turkey.

White Adriatic—ADRIATIC.

White Bardakjik—BARDAKJIK.

White Baltadjik—BARDAKJIK.

White Barnissotte—BARNISSOTTE, WHITE.

White Douqueira—DOUQUEIRA BLANCA.

White Genoa—GENOA, WHITE.

White Marseillaise — MARSEILLAISE, WHITE.

White Monaco—MONACO BIANCO.

White Mussega—MUSSEGA.

White Naples—MARSEILLAISE, WHITE.

White Rondella—RONDELLA BLANCA.

White Rose—ROSE BLANCHE.

White Saint Peter—SAN PEDRO, WHITE.

White Standard—MARSEILLAISE, WHITE.

White Toulouse—BLANCHE DE TOULOUSE.

White Verdal—VERDAL, WHITE.

White Versailles—BLANCHE DE VERSAILLES.

Wild Fig—CAPRIFIG.

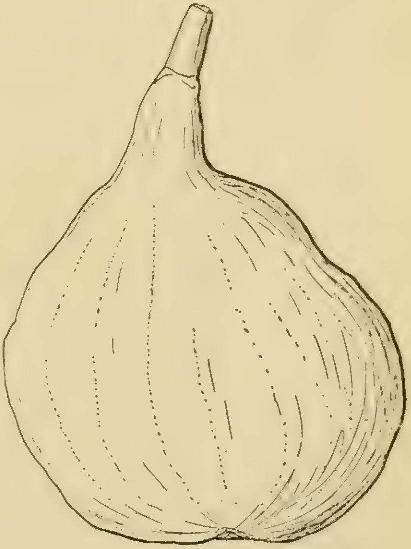


FIG. 93.—Versailles fig.

Williamson.—Below medium; about 1⅝ by 1½ inches; shape round, slightly flattened at apex: no neck: stalk short to medium: ribs numerous, not greatly elevated, but still quite distinct from stalk to near the eye. Eye open, large, scales not protruding, but flat and level with the apex. Skin greenish yellow, evenly diffused, semitransparent, slightly downy; pulp and meat amber white around the eye: seeds very large. A very good fig—in the author's opinion identical with the White Marseillaise, which it resembles in every respect. Distributed by Mr. Williamson, of Sacramento. The above name is proposed until the true name be found, although the author is almost positive that it is identical with the Marseillaise White.

Wilson—*Smyrna.* (See Smyrna figs p. 279.)

Winter Fig—NATALINO.

Yellow Angélique—ANGÉLIQUE.

Zimitza.—Medium or below, longer than broad, turbinate; stalk large, about one-fourth as long as the fig; no neck; skin slightly downy, of a greenish olive color, mottled and dotted white or light yellow, lighter at the stalk end. Eye closed, scales greenish, shaded brown, iris light brown; pulp amber, with a slightly reddish center; leaves deeply but narrowly lobed. Good bearer and grower, and one of the latest of all figs. Dalmatia—possibly identical with Natalino. Specimens described were from trees imported from Dalmatia.

Ziza Kheden.—Large, oblong, color blackish violet; pulp red. Algiers.

SMYRNA FIGS.

Under the name of Smyrna figs we should include only such varieties as actually grow in Smyrna and which require caprification in order to set fruit. The practice to indiscriminately name varieties Smyrna figs should now be discarded, and the buyer of fig trees should insist upon having the pedigree of the trees sold. There are now fruiting in California some ten different varieties of these figs, some having proved to belong to the best types of Smyrna fig, grown in Smyrna for commercial purposes and distributed from that place all over the world. Most of the following varieties have fruited in California. The descriptions are based, for the most part, on observations during the season of 1901, after the preceding pages were in type and are inserted here because of the commercial importance of these varieties:

Bardakjik—*White Bardakjik; White Baltadjik; Bartadjic.*—Fruit large to very large, ovate, pyriform, with long neck and stalk. Skin very thin, greenish gray. Ribs distinct; light gray, covered with small gray dots. Eyes deep red. Pulp rich, deep crimson. Tree a compact grower, spreading. Leaves large, 5-lobed. A first-class table fig, also used for drying. The form of the fig resembles an Egyptian pitcher for holding water—bardak meaning pitcher—hence the name.

Bardakjik, Black—*Bartakjik; Black Bardakjik.*—Large, oblong, pyriform, black. A very fine table fig from Smyrna, Asia Minor, where with the white Bardakjik it is considered one of the very finest table figs. It will also dry well.

Blowers—*Blowers's Smyrna.*—Fruit medium, about 1⅝ inches long by 1¾ inches wide. Ribs heavy. Neck crooked, with short stalk. Skin yellowish green, with gray bloom. Ribs darker than the other parts of the skin, which is spotted over with gray dots. Eye open, dark green. Flesh blood red, tender, and sugary, with a rich sirup. Seeds small, yellow. Tree medium of upright growth, with heavy branches. Leaf 9 inches wide by 10 inches long, 3-lobed, and a few 5-lobed. Both surfaces green, upper surface rough and glossy; veins yellowish green. Stalk of leaf about 3½ inches long. Edges of leaves indentated. This very distinct variety was one of the Bulletin importation, and first planted on the place of R. B. Blowers, from which the tree at Niles is an offspring. The Turkish name is not known. Description partly from notes of Mr. J. C. Jones.

Kassaba—*Cassaba.*—Fruit medium to large, almost globular, somewhat flattened at apex. Neck short; stalk short. Eye large, open. Skin pale green. Pulp reddish pink. Seeds small. Very sweet. Tree an upright grower. (Roeding's description.)

Leker Ingir.—Fruit roundish, oblate, with short neck. Pulp reddish pink. Seeds small. Skin greenish ocher, very thin, with dark specks. Ribs distinct; light greenish. Tree a very strong grower, with heavy and closely jointed branches. Growth upright. Leaves very large, deeply cut, and slightly indentated. Description after Schwarz. Imported by Roeding.

Lob Ingir—*Bulletin Smyrna; Commercial Smyrna* (California); *Erbeghli; Erbelli; Erbeili.*—Fruit large to very large, about 2¾ inches wide by 2½ inches long; decidedly flattened like an onion, being compressed in the diameter of stem to eye. Neck thin, distinct but short, generally straight. No stalk or one very short. Ribs heavy, uneven, knotted and branching. Eye large, with numerous scales of amber tint, open and about three-sixteenths inch wide, so that the pulp can be seen through the opening. Skin the color of beeswax, smooth and waxy, shaded greenish. Pulp pale to dark amber; when unripe, shaded red. No distinct iris. Seeds large, flattened. Tree a strong, spreading, but rather straggling grower, with heavy branches, easily broken off through splitting. Leaves large, about 8 inches broad by 8¼ inches long, with 5 thin, deep lobes, with dentiferous edges. Leafstalks heavy, about 3½ inches long. Color of leaves dark green on upper side, light green on under side. This fig is the best type of Smyrna fig, and the majority of figs imported from Smyrna to this country belong to this variety. This tree should be encouraged to branch close to the ground. It is now widely disseminated in California, and trees 20 years old are growing in many places, showing that the variety thrives in various parts of that State. First imported by the Bulletin Company, later by Roeding.

Maple-leaved Smyrna—*Smyrna, Maple-leaved.*—Fruit medium, turbinate, rounded at apex, with short stalk and neck. No ribs. Eye wide open, dark yellow in color. Skin pale, yellowish green or greenish ocher, without any dark specks, in this differing from Leker Ingir. Pulp paler than that of Leker Ingir, honey colored, with red streaks. Tree of spreading habit, branches short jointed. Leaves large, deeply lobed, and serrated, standing upright. Description after Schwarz and Jones. Imported by Roeding.

Purple Smyrna—*Bulletin Black; Smyrna Black.*—Fruit medium to large, pyriform, flattened, about 2½ inches wide by 2¼ inches long. A very short, curved neck characteristic of the variety. Stalk very short, about one-eighth inch long. Many ribs of even size. Eye flat, with 5 scales, surrounded by a dark and flat iris. Color of skin brownish purple shaded greenish. Pulp reddish brown. Flowers and seed small. Flesh violet white. Sirup sweet and highly flavored. When dried it makes a fine black fig, better than the Mission. Tree large, spreading, strong grower, and heavy branches. Leaves 9½ inches long by 9 inches broad, 5-lobed, the end lobe the largest. Two of the sinuses are very deep. Stalk medium, about 3½ inches. Imported first by the Bulletin Company, later by Roeding.

Round White Smyrna.—Fruit, large, about 2⅜ inches long by 2½ inches wide, almost globular, with a short neck; apex sometimes flattened; ribs plain. Skin tender, yellowish green with gray bloom, and with long, grayish spots. Eye grayish when ripe, pinkish when unripe, open. Pulp strawberry red, surrounded by a white flesh. A rich, white sirup, fig sweet and highly flavored. Seeds yellow, small. Tree a strong grower, spreading, heavy branches. Leaf very large, about 10 inches long by 9 inches wide, 3-lobed, a few 5-lobed, the point of the middle lobe making an angle of 90 degrees. Leaves dark green, upper surface rough, but glossy, under surface with yellowish-green veins. Edges of the 3-lobed leaves indentated. Stalks about 3½ inches long. A very fine variety. Also sent out as West's Smyrna, because it was first planted on West's place when imported by the Bulletin. The Turkish name not known. Description from notes by Mr. J. C. Jones, of Niles.

Small Purple Smyrna—*Smyrna, Small Purple.*—Fruit small, globular, with short stalk and no neck. Skin purple-olive, very thin, with light-gray ribs, dotted over with round, brownish dots. Pulp a dark amber or rose amber. Eye never opens widely. Tree small and dense, growing in the form of an umbrella. Turkish name not known. Imported by Roeding. Description after notes by Schwarz and J. C. Jones. Mr. Schwarz noted that the leaves of this tree are very large and that they drop from the tree earlier than those of any other Smyrna variety.

Wilson—*Smyrna.*—Fruit about 2 inches wide by 2⅜ inches long; pyriform, with almost no neck or one that is very short; when present it is slightly bent. Stalk short, seldom more than one-fourth inch long. Ribs few, plain, large. Skin thin, green, covered with gray bloom and dotted over with numerous oblong, white specks. Eye medium, with five large scales edged with pink. Pulp very full, rosy red. Seeds small amber in color and very hard. Flesh white and very narrow. Tree a strong grower and of spreading habit. Leaves shallow, 3-lobed, about 7½ inches long by 7 inches wide; under surface woolly; upper surface smooth and glossy. A valuable variety sent out by the U. S. Department of Agriculture in 1891 and labeled "Smyrna." It fruits only with caprification. The variety is named for the honorable Secretary of Agriculture, James Wilson, under whose administration as Secretary of Agriculture the Blastophaga wasps have been successfully introduced to California, and the culture of Smyrna figs been made a perfect and unqualified success.

CAPRIFIGS.

Most of the following caprifig varieties, twenty in number, are now growing in California in the experimental nursery at Niles. As far as is known, no caprifigs have previously been described, and it is to start an investigation of these varieties that the following descriptions are offered. The imperfections in some of the descriptions are due to the fact that some of the varieties have not yet come into full bearing in this country. The value of caprifigs is fully equal to that of the Smyrna varieties. The caprifigs, when first received, were simply labeled No. 1, 2, 3, etc., and much confusion has been the result. In order to help straighten out this difficulty I have here proposed new names for such varieties as were not properly named before.

Algiers No. 1.—Strong grower, with thick, upright branches. This variety was received by Mr. John Rock from the Department of Agriculture as being imported through Dr. Swingle from Algiers. No name was given. It has not yet fruited.

Algiers No. 2.—Medium growth, with slender, upright branches. Sent to Mr. John Rock from the Department of Agriculture as being imported through Dr. Swingle from Algiers. Has not yet fruited.

Brackett—*Paul Meyer No. 2.*—Profichi 1½ inches wide by 2⅝ long. Color green or yellowish-green. Male flowers abundant, with plenty of pollen. Gall flowers numerous. Tree a strong grower; main branches grow straight upward and side branches grow straight outward at an angle of 20° from the main branches, having a great tendency to spread. Not edible. One of the best caprifigs, according to Mr. John C. Jones, who has studied this fig at Niles. The tree was originally imported from Italy, having been sent me by Dr. Paul Meyer. As it has no Italian name I have named it for Col. Gustavus B. Brackett, Chief Pomologist, Department of Agriculture, Washington, to whom the fig growers of the United States are greatly indebted for his interest in this branch of horticultural science.

Bulletin—*Capri Smyrna No. 4.*—Profichi large, turbinate, with distinct neck. Color greenish-yellow. Numerous male flowers and pollen. Mammoni very rare. No mamme have ever set. Leaves large, rather entire. Tree a sturdy grower. This variety was the original caprifig imported to California by the Bulletin Company. The original tree is now dead, but younger trees have been started from cuttings. Differs from other caprifigs imported from Smyrna.

Howard—*Solms-Laubach No. 3.*—Insectiferous profichi, about 2½ inches long by 1¼ wide, with distinctly set and well-defined neck, the narrow part being three-fourths inch long. Fig ovoid-turbinate, with indistinct ribs. Eye large to medium in size, with very large scales of yellow color. Exterior male zone smooth. Color of skin brownish-violet with green on the neck. Meat with thin rim of violet. Male flowers confined to eye zone. Gall flowers are not closely set. Abundant pollen. Profichi all fallen in the beginning of August. Polleniferous flowers much smaller, about 1½ inches long by three-fourths inch wide. Meat without any violet. Mammoni numerous August 24, some being about 1 inch in diameter, though the majority are smaller, as large as peas. All are situated in the top of the tree. Tree of sturdy and robust growth. Leaves 3-lobed, about 6 inches long by 5 inches wide. This valuable caprifig was received from Professor Solms-Laubach, Naples. Named for Dr. L. O. Howard, Chief of the Entomological Division of the United States Department of Agriculture, who has done much to unravel the difficult question of caprification.

Large Wild.—Under this name Barron refers to a wild caprifig somewhat larger in size than SMALL WILD.

Maslin.—Leaves very large, entire, strongly hairy, on both upper and under sides; the under side being very rough, the upper side smooth. Profichi with many male flowers. Mammoni with few male flowers, but with many gall flowers. Many mamme setting about October 15, at San Francisco. Figs large, turbinate, with long stalk and distinct neck. Scales of eye, pink or red. Strong grower. A seedling accidentally raised in a garden in San Francisco. A very remarkable and undoubtedly valuable variety. One of the most promising, not only on account of its growth, but from the fact that being raised in California it is likely to be adapted to the climate of that State. Named for Mr. E. W. Maslin, of San Francisco, one of the first horticulturists in California to interest himself in Smyrna fig culture.

Meyer—*Paul Meyer No. 1.*—Profichi, 1½ inches wide by 1¾ inches long. Color yellowish-green. Male flowers abundant. Gall flowers numerous. The tree is a strong grower, and the branches have a tendency to grow upright. Mr. John C. Jones, who has given me this description taken from the tree at Niles, Cal., considers this variety one of the best. The fig is not edible. This variety was sent to Mr. Rock and myself by Dr. Paul Meyer, of the Zoological Station at Naples, as a most valuable variety.

Milco—*Endrich.*—Insectiferous profichi, large, about 2 by 2 inches or less, globular or slightly lopsided. Skin pure green, smooth, and waxy, without any prominent ribs. Eye small, with pink-colored scales, and without any conspicuous iris. Figs are firm and rather hard even when ready for caprification. Male flowers confined to zone around the throat. Gall flowers are larger than on any other variety known so far, and very numerous, filling the whole of the cavity of the receptacle, the latter being shallow and not pointed at the bottom. Meat green with a broad violet zone. Not a trace of violet on the skin. The blastophaga from the profichi hatch from July to September, an unusual length of time. The mammoni are more rounded and somewhat smaller than the profichi, beginning to set long before the wasps from the profichi have ceased to hatch. Tree a very strong grower and dense. Leaves large to medium, 5-lobed. Of all the caprifigs tried at Niles this is the most promising variety, being of remarkable growth and fertility, there being no cessation of crops the year around. This fig has also been sent out as Endrich. Originally imported by G. N. Milco from Dalmatia. It is the best variety that I have seen for holding and breeding the wasps.

Mitchell.—Leaves small to medium, the smaller leaves generally being 5 and 3 lobed, while the larger leaves are almost entire; surface rough and deep gray-green. The leafstalks are bright red, and in this respect differ from any other caprifig known to us in California. The profichi are turbinate, with long and distinct neck and stalk. As far as can be seen from uncaprificated trees the figs are rough, lopsided, and when matured will probably be red. The profichi have more male flowers than any other variety seen by me. The profichi and mammoni crops overlap each other. This very interesting and probably very valuable variety was originated in a garden in San Francisco, probably from seed. The fig is named after Mr. George O. Mitchell, who has kindly donated the trees for further propagation.

Pingo de Mel—*Italian No. 3.*—Insectiferous profichi are very large to medium. Form turbinate, with a very short, distinct, and thin neck. Skin smooth and waxy, pale green, with indistinct ribs. Eye small, scales large, amber. Male zone distinct but small. Pulp and flesh white amber. Tree is sturdy and dense, of very good habit. Leaves medium to large, 5-lobed, rounded, with rounded lobes, deeply cut. The lobes are wide and overlap each other, so that the sinuses do not show well. Stems of leaves very long. The profichi are remarkable on account of their juicy pulp, which makes them desirable as a fine table fig. This fig was received through the Department of Agriculture from the Royal Horticultural Society of London under the name of Pingo di Mel. As this variety is a fine edible fig, no doubt the name is correct. As a caprifig its qualities have not yet been proven, the fig not having been caprificated in time.

Rivers—*Italian No. 2.*—Insectiferous profichi medium, turbinate, with a very short neck and several distinct ribs. Color greenish without violet or brown. Growth dense and branches sturdy. Leaves thick, grayish-green, 5-lobed. This tree was imported many years ago by Mr. John Rock from Thomas Rivers & Son, London. The variety promises to be of great value on account of its strong growth. It is supposed to be of Italian origin.

Rock—*Solms-Laubach No. 2.*—Insectiferous profichi, about 3½ inches long by 1¾ inches wide, oblong, pyriform, with long neck, the narrow part of the neck being about 1 inch long. About one dozen distinct ribs of darker color, the ribs being less dark than those in capri Schwarz. Eye medium, with yellowish-brown scales. Exterior zone of male flowers sunk and not prominent. Male flowers confined to zone around the eye. Pollen not abundant. Galls small and grayish-white. Meat whitish, streaked violet. Color of skin violet-mahogany, with numerous small oblong pits, generally of whitish color. Skin shaded greenish on the shady side. Polleniferous profichi: smaller, about 2½ inches by 1½ inches, rounded-turbinate. Neck shorter, narrowest part about one-fourth inch. Color of fig yellow-green with brownish flush. Male flowers confined to eye zone. Gall flowers all degenerated and shrunk. Little pollen. Meat yellowish-green with only very little or no violet around the male zone. Cavity of the receptable rather shallow and rounded at the bottom. In the insectiferous profichi the receptacle is long and pointed in the bottom. Mammoni begin to set at Niles after August 24, none being visible at that date, most of the insectiferous profichi having then fallen. Tree of medium and spreading growth. Leaves of two sizes, some 3 by 3 inches, others 4 by 5 inches, 3-lobed. The smaller leaves are serrate, while the larger leaves are smooth and almost entire. A few leaves are 6 inches broad by 5 inches long. Received from Professor Solms-Laubach, Naples. It is named for Mr. John Rock, now owner of the largest assortment of fig varieties collected in one place.

Roeding—*Smyrna No. 1; Roeding No. 1.*—Profichi about 1½ inches wide by 2¼ long. Neck well set, ribs distinct, but few. Skin smooth, waxy, of a pale yellowish white, shaded slightly rosy on the sunny side. Eye very small, amber. Cavity of receptacle small and rounded in the bottom. Gall flowers comparatively few. Many male flowers with plenty of pollen. Polleniferous profichi very small, with a minute central cavity. Tree not dense, limbs spreading and slender; leaves 5-lobed, a few 7-lobed; lobes pointed, deep, the sinuses running to or below the center of the leaf. The profichi on this fig are early, and of the three Smyrna caprifigs it is the best for carrying wasps in the profichi (according to observation of Mr. John C. Jones). The fig was first imported by Mr. Fred. Roeding from Smyrna.

Schwarz—*Solms-Laubach No. 4.*—Insectiferous profichi, about 2½ inches long by 1½ inches wide. Neck distinct and well set, the narrow part one-half inch or so long. Skin smooth, but not waxy, slightly wrinkled and with many indistinct and narrow ribs. The ribs are darker than the skin and the fig appears striped. Color of skin deep mahogany-brown violet, shading to lighter on the side and neck. Eye large, somewhat protruding, with small red scales and a distinct dark iris, outside of which is a hard and light-colored zone, indicating the extent of the male-flower zone. Male-flowers fill not only the zone around the eye, but extend far down the sides of the receptacle in streaks. Pollen not abundant. Meat is yellow, streaked violet and red. Tree is robust, with strong branches. Leaves below medium, 5-lobed as a rule, but some are also 3-lobed, rather entire in outline. Average leaf about 6 inches long by 7 inches wide. Many profichi left on August 24. Many mammoni of the size of a pea at that date, the largest being 1 inch in diameter. They commenced setting about August 1. This fine caprifig was also received from Professor Solms-Laubach, Naples, Italy. Now named for E. A. Schwarz, of the United States Department of Agriculture, whose investigations on caprification and the blastophaga are of the greatest value.

Small Wild.—Under this name, Barron mentions a small, white caprifig, native of Spain. Another caprifig of larger size he calls Large Wild.

Smyrna No. 2—Insectiferous profichi; turbinate, about 2¼ inches long by 1¼ inches wide. Neck thin, distinct, and well set. Ribs many, indistinct. Eye medium, amber color. Skin smooth, glossy, pale green. Cavity of receptacle shallow, rounded. A deep violet margin around the cavity. Excellent for carrying wasps in the mamme. (Mr. John C. Jones.) Top dense, growth strong and upright. Leaves smaller than in Smyrna No. 1, with rough surface, 5-lobed, the end lobe the longest. Leaf is longer than wide and with long stalks. First imported by F. Roeding.

Smyrna No. 3—Profichi in size and color as Milco, rounded turbinate and greenish yellow. Male flowers abundant. Gall flowers numerous. Color of flesh white with purple tint; not edible. Tree a strong, upright grower, with slender branches and small leaves. The best of the Smyrna varieties, according to Dr. Schwarz and Mr. J. C. Jones.

Solms-Laubach—*Solms-Laubach No. 1.*—Insectiferous profichi about 3 inches long by 2¾ inches wide. Form lopsided, turbinate, with about 10 double ribs, especially distinct on the neck. Skin somewhat waxy and not downy. Neck distinct but short, the narrow part being about one-half inch long. Color dull mahogany brown, with violet flush in sun, the shaded side being green. Eye medium, with brownish black scales. No distinct iris. Polleniferous exterior zone not prominent. Male flowers numerous and full of pollen, situated mostly around the throat, though single male flowers are scattered all through the cavity of the receptacle. Meat yellowish white, with a few violet streaks. Mammoni begin to set at Niles about August 24. A number of insectiferous profichi left at that date. Tree slender, growth weak but dense. Leaves small, green, 5-lobed, deeply cut, and about 5 inches in diameter. Received from Professor Solms-Laubach, Naples.

Swingle—*Algiers No. 3; Capri Smyrna No. 4.*—Mamme large, greenish-yellow, with an abundance of gall flowers. This tree was imported by the Department of Agriculture from Algiers and was the original tree from which the blastophaga on the Roeding place emerged in the spring of 1899, and from which all blastophaga in California have descended. The true name is not known by the writer. This tree does well at Niles. It is now named for Dr. Walter T. Swingle, of the Department of Agriculture, through whose agency the blastophagæ were first successfully established in California.

Taylor—*Troano; Italian No. 1.*—Insectiferous profichi medium, of a light-green color, with a purple tint. Mammoni large, round, and very early, the earliest of any variety so far under examination. Leaves large, shallow, 3-lobed or entire, about 8 by 9 inches long, very stiff. Growth medium, spreading. This variety was received from the Department of Agriculture, Washington, several years ago under the name of *Troano*. It is presumably an Italian variety, having been received by the Department under a wrong name. On account of its very early mammoni this caprifig will prove very desirable. As it is entirely hopeless to ever expect any identification of the Italian caprifigs which even in their native country do not possess special names, I have named this variety after Mr. William A. Taylor, Assistant Pomologist, United States Department of Agriculture, who has done much to promote the cultivation of the fig in the United States.

CHAPTER XVI.

CHEMICAL ANALYSIS OF SOILS AND FIGS.

The following analysis of soils from Smyrna fig districts was made at the agricultural department of the University of California, under the direction of Prof. E. W. Hilgard, and published in a bulletin of the California State Experiment Station:

Soil ingredients.	Asia Minor.		
	A.—Soil, Smyrna, sent from Department of Agriculture, Washington.	B.—Soil, Erbeyli district.	C.—Soil, Erbeyli, Aidin district.
	Per cent.	*Per cent.*	*Per cent.*
Coarse materials>0.5mm	35.00	1.00	40.00
Fine earth	65.00	99.00	60.00
Analysis of fine earth.			
Insoluble matter	67.19	76.33	84.29
Soluble silica	7.23	5.35	2.46
	74.42	81.68	86.85
Potash (K_2O)	.55	1.09	.43
Soda (Na_2O)	.12	.19	.07
Lime (CaO)	4.44	1.96	1.40
Magnesia (MgO)	2.29	1.56	1.17
Red oxide of manganese (Mn_3O_4)	.01	.01	.06
Peroxide of iron (Fe_2O_3)	5.22	6.49	3.42
Alumina (Al_2O_3)	4.21	3.25	3.18
Phosphoric acid (P_2O_5)	.37	.29	.30
Sulphuric acid (SO_3)	.04	.06	.03
Carbonic acid (CO_2)	2.65	1.00	----------
Water and organic matter	5.46	2.29	3.00
Total	99.78	99.87	99.91
Humus	.74	.27	.40
Ash	.33	.24	.40
Soluble phosphoric acid	.05	.03	.04
Silica	.19	.21	.24
Hygroscopic moisture, absorbed at 15° C	4.14	1.93	2.09

The soil B is the only one which with a certainty was taken from a fig orchard. It consisted of a fine gray alluvial loam, with a great quantity of very fine mica, and with no large or coarse grit or rocks, almost as light as dust. This soil is remarkable for its quality of preserving moisture—a soil very similar to that found in many of the California and Arizona bottom lands along rivers and creeks, as, for instance, in Kern County in the Weed Patch, along Kern River, along Kings and Sacramento rivers, Gila River, etc. The soil of the Meander Valley does not bake, but remains light even after wetting. It is, however, to be noted that the soil in that valley varies somewhat as to texture and capability of preserving moisture, and this more than its chemical constituents determines the quality of the figs, atmospheric conditions being equal. The above reference to the Meander

Valley soil should not be understood to mean that figs may not do as well in other varieties of soil, nor that the Pacific coast localities mentioned are preeminently suited for fig culture.

The following analysis of figs and other fruit was made at the agricultural laboratory of the California State Experiment Station at Berkeley, under direction of Prof. E. W. Hilgard:

The table below makes it evident that among California fruits the figs hold no mean place in sugar contents.

Percentages of sugar and acid.

Fruits.	Number of analyses.	Juice.		Sugars.	
		Acid.	Sugars.	Flesh.	Whole fruit.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*
Figs, White Adriatic	2	0.15	23.90	....	19.20
Other figs, from Tulare	9	.10 to .20	10.00 to 29.00	....	8.0 to 19.20
Apricots	11	.68	13.31	11.93	11.10
French prunes	13	.31	23.69	19.70	18.53
Plums	3	.48	17.97	13.25	12.89
Peaches	2	.24	17.00	13.40	12.50
Grapes	......	.50	24.00	23.00	20.70
Oranges	80	1.28	10.68	7.12	5.40

The acid of the figs, expressed in terms of sulphuric (SO_3) for the sake of comparison, seems thus to be very much lower than that found in any of our other fruits.

NUTRITIVE VALUES—NITROGEN CONTENTS.

Without repeating what has already been published by this station in its fruit bulletins relative to the importance of the flesh-forming ingredients (albuminoids) of our fruits, we give below, in tabular view, the average amounts of these materials contained in some of the fruits we have examined and considered. Added to this are such data from European sources as are at hand.

Average percentage of albuminoids.

Fruits.	Number of analyses.	Total in whole fruit.	Calculated to whole fresh fruit.	
			In the fresh flesh, or edible portion.	In fresh pits or rind.
Figs.				
California:				
White Adriatic	2	1.50	(1.50)	....
Others	6	1.20	(1.20)	....
Europe	......	1.42	(1.42)	....
Oranges.				
California	35	1.14	.76	0.38
Europe (Sicilian)	......	1.78	....	....
Apricots.				
California	11	1.25	1.088	.162
Europe	......	.49	....	....
Prunes.				
California	20	1.012	.837	.175
Europe	......	.780	....	....
Apples and pears.				
Europe	......	.375	....	....

As heretofore pointed out in Bulletin 101, the fig rates first in flesh-forming materials among our fruits: apricots and plums second: prunes and oranges third.

It is interesting to reproduce, at this point, a summary of the food constituents of some of our dried fruits as compared with the dried fig. In addition, the analysis of a sample of California raisin is here reported.

Percentage composition of dried fruits.

Contents.	Dried edible portion.		Raisins (Muscat).	Figs (White Adriatic).	Figs (imported Smyrna).*a*	Apples (European).
	French prunes.	Apricots.				
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Water	25.20	32.44	18.95	25.00	21.06	33.00
Ash	1.50	1.38	1.55	2.24	1.80	1.40
Albuminoids (crude protein)	2.80	2.90	4.00	4.50	4.06	1.70
Crude fiber	------	------	------	------	------	8.30
Nitrogen-free extract	29.77	32.18	2.30	10.11	10.18	21.60
Fat	------	------	------	------	------	------
Sugar	40.53	29.59	72.50	57.60	62.50	32.00
Free acid, calculated as sulphuric (SO_2)	.40	1.51	.70	.45	.40	2.00
Total	100.00	100.00	100.00	100.00	100.00	100.00

a Analyzed at this station.

As stated in previous fruit bulletins, these results are too meager to serve as the basis for a general discussion of the relative food values of the fruits examined. However, we note some wide differences among the nutrients. For instance, the sugars and albuminoids, or crude protein, show considerable variation: the apricots, like the apples, yielding less than one-half as much sugar as the Muscat raisin, which contains nearly twice as much sugar as the prunes, and one and one-fourth times as much of that substance as the fig. European analyses of raisins show figures for sugar contents which differ but little from those we give here. Both raisins and figs, with respectively 4 and 4.5 per cent albuminoids (flesh-forming materials), stand from one and one-half to two times above the other fruits in this respect. The fig yields nearly twice as much ash as the other fruits here reported.

ASH COMPOSITION AND NITROGEN CONTENTS.

The fig stands second in amount of mineral matter withdrawn from the soil for equal weights of the various fruits. From European data we place grapes first in this respect, and from our own findings the orange third, and the prune, apricot, and plum fourth. We report an ash analysis of the White Adriatic fig from Kern County, and as the figures there represent a considerable district we can take them as a fair guide, the analysis of the ashes of other fruits from different localities in California having shown that the variations will not be great enough to vitiate the conclusions. But few European analyses of fig ashes are at hand, and their great discrepancies necessitate an analysis by us of the ash of an imported fig. The results obtained are given in the accompanying tables, and it will be noted that the figures agree, within the limits to be expected, with those we report for our figs.

The following table gives the amounts, in pounds, of vital soil ingredients extracted by the different fruit crops (for fruit alone) that will have to be replaced by fertilization:

Soil ingredients extracted by different fruit crops.

Fruits.	Total ash.	Potash.	Phosphoric acid.	Nitrogen.
Figs.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Europe: [a]				
In each 1,000 pounds	8.00	3.89	0.89	2.27
Crop of 15,000 pounds	120.00	58.35	13.35	34.05
California (White Adriatic):				
In each 1,000 pounds	7.81	4.69	.86	2.38
Crop of 15,000 pounds	117.15	70.45	12.90	35.70
Grapes.				
Europe:				
In each 1,000 pounds	8.8	5.00	1.52	1.70
California apricots.				
In each 1,000 pounds	4.91	2.90	.64	1.94
Crop of 30,000 pounds	147.30	87.00	19.20	52.20
California prunes.				
In each 1,000 pounds	4.86	3.10	.68	1.62
Crop of 30,000 pounds	145.80	93.00	20.40	48.60
California oranges.				
In each 1,000 pounds	4.32	2.11	.53	1.83
Crop of 20,000 pounds	86.40	42.20	10.60	36.60

[a] Imported; analyzed at this station.

With the exception of the grape, it seems that the fig draws rather more heavily upon the mineral ingredients that will need to be replaced by fertilization than do any of the other fruits we have examined, following closely the amounts taken up by the grape and fig of foreign growth. As compared with the fig, apricots and prunes, like oranges, do not in any case draw nearly so heavily upon the mineral matters. Lemons and plums, however, very nearly approach it. And among the figs we note that the White Adriatic stands somewhat above the other figs in this respect. As to nitrogen, it is readily seen that among our fruits the figs, on the whole, draw decidedly the highest amount and are quite like those of foreign production in this regard. Here again the White Adriatic appears to lead.

Potash.—In the ashes of the fig, as in the prune, apricot, orange, and lemon, we find potash to be the leading ingredient, amounting to about three-fifths of the whole ash. From the partial ash analysis, given above, of the imported Smyrna fig, we find the potash to be four-fifths as much as is contained in the ashes of figs of California growth.

TABLE OF SOIL ANALYSES.

The comparison of the analyses of the Asia Minor soils with those from this State shows very strikingly the richness in phosphoric acid of the former over the latter. The lowest percentage of this ingredient in the Asia Minor soils, 0.29 found in soil B, is more than one and one-third times as much as the highest, 0.22 shown in soil No. 1466, of the California soils, and the average, 0.32 per cent, of the three Smyrna soils is almost exactly four times the average for all California soils examined (about 200 in number) and nearly three times the figure 0.113, denoting the average of phosphoric acid for 466 soils of the humid region (east of the Rocky Mountains) of the United States.

With reference to lime, the average for the Asia Minor soils is 2.60 as against 1.08 for California. The figures 0.690 for Asia Minor and 0.644 for California, representing the averages for potash, show that both sets of soils are about equally well supplied with this element of plant food.

Below is a tabular view of the averages just discussed:

Average percentages of the important ingredients in soils of arid and humid regions.

Soil ingredients.	Arid.		Humid.
	California (average of 198 soils).	Asia Minor (average of 3 soils).	United States east of Rocky Mountains (average of 466 soils).
Potash	0.644	0.690	0.216
Lime	1.078	2.600	.108
Phosphoric acid	.083	.320	.113
Humus	1.040	.470	2.390

The above little table conveys a forcible illustration of an arid region showing far greater amounts of potash and lime in its soils than does a humid one.

Chemical analysis of the ashes of a Smyrna fig (Eleme)—after Wohltman.

	Per cent.
CaO	18.9
MgO	9.2
P_2O_5	1.3
KO	28.4
NaO	26.3
Fe_2O_3	1.5
Cl	2.7
SO_3	6.7
SiO_2	5.9
Total	100.9

Analytical table of figs from various localities.

[The second numerals are from samples absolutely dry.]

	Smyrna, Eleme (Asia Minor).	Palermo (Sicily).	Vallo (Cosenza).	Belvedere marittimo (Cosenza).	Roccanova (Basilicata).	Taranto (Terra d'Otranto).	Brindisi (Terra d'Otranto).	Melpiznano (Terra d'Otranto).	Monopoli (Terra di Bari).	Turi (Terra di Bari).	Cilento (Province Salerno).	Sorrento (Peninsula Sorrentina).	Ischia (Gulf of Naples).	Sora (Terra di Lavoro).
Water	17.31	17.90	20.30	23.00	19.76	20.49	19.12	20.04	18.40	23.30	18.04	18.95	22.30	18.60
Sugar	58.00	60.98	60.02	61.00	59.30	57.04	59.85	58.86	61.18	57.02	62.90	58.75	60.80	56.60
	72.53	74.05	75.30	79.23	73.96	72.61	74.00	73.61	74.07	74.34	76.74	72.48	78.26	69.53
Albumen	5.70	5.45	5.01	3.85	4.03	5.00	5.04	4.30	5.18	4.05	4.97	4.90	3.70	5.30
	7.13	6.63	6.28	5.00	5.02	6.28	6.22	5.37	6.34	5.23	6.06	6.04	4.89	6.51
Starch	3.0													
Pectose and pectin	5.90	6.19	6.30	6.00	7.02	7.03	6.41	5.92	6.91	5.00	6.39	6.30	4.99	5.90
	7.37	7.67	7.94	7.65	8.77	8.04	8.03	7.18	8.49	6.53	7.81	7.77	6.17	7.26
Fat	0.98	1.85	0.97	0.94	0.99	1.39	0.89	1.98	2.14	2.06	0.95	2.04	1.72	2.30
	1.23	2.25	1.21	1.22	1.23	1.74	1.10	2.47	2.62	2.68	1.15	2.51	2.21	2.82
Fiber	6.94	4.90	4.70	3.40	5.90	5.92	6.18	6.20	4.04	5.92	4.05	5.21	3.56	7.40
	8.68	5.96	5.89	4.42	7.35	7.49	7.65	7.87	4.95	7.72	4.95	6.42	4.50	9.09
Ashes	2.45	2.81	2.70	1.91	3.00	3.13	2.51	2.70	2.15	2.65	2.70	5.85	3.09	3.90
	3.06	3.42	3.38	2.48	3.73	3.93	3.00	3.50	2.63	3.45	3.29	4.78	3.97	4.79
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Medium weight	20.03	21.5	11.5	10	9.60	10.5	10.5	10.62	11	8	10	8.4	9	7.60

CHAPTER XVII.

STATISTICS OF THE PRODUCTION AND IMPORTATION OF FIGS.

Compiled by E. W. Maslin, *San Francisco, Cal.*

The production of dried figs in California can only be approximately estimated, as there are no statistics in the possession of the various railroads in the State which make a distinction between figs and other dried fruits. Of the many small lots of dried figs which are produced everywhere all over the State of California no account is taken. Dried figs are used for cooking and pickling in almost every family on the Pacific coast, and the total amount thus produced and consumed must be very large. Thus figs are constantly brought in from the country farms to the smaller towns and consumed there. Our only detailed statistics are had from the special packers of figs, the most prominent of which are found in the San Joaquin Valley in California. These packers estimate the output of dried figs shipped outside of the valley at 300 carloads, at 10 tons each. This makes for the whole valley of the San Joaquin 3,000 tons, or 6,000,000 pounds. If we presume that the total output of dried figs from all of California is at least 350 carloads, or 7,000,000 pounds, it will be seen that California alone produces now at least one-half of the quantity of dried figs consumed in the United States. But this estimate is entirely too low. The true figures are undoubtedly at least 1,000,000 pounds higher.

The following tables show for ten fiscal years the quantity and value of figs imported from Turkey in Asia and from all foreign countries:

Quantity and value of figs imported into the United States during the ten years 1890-1899, and the proportion furnished by Turkey in Asia.

Fiscal years ending June 30—	Total imports.		Imports from Turkey in Asia of the amounts in preceding columns.	
	Quantity.	Value.	Quantity.	Value.
	Pounds.		*Pounds.*	
1890	9.966,993	$442,924	6,906,616	$301,112
1891	9,063,663	672,141	6,199,124	486,767
1892	8,324,861	510,591	4,904,942	314,699
1893	10,503,928	548,995	8,426,723	355,643
1894	7,985,959	392,040	4,634,268	234,174
1895	11,855,890	587,420	7,294,131	378,679
1896	11,900,710	639,512	10,283,906	563,851
1897	8,940,762	535,380	7,416,300	449,844
1898	9,628,426	509,002	6,872,857	406,213
1899	7,284,058	356,762	1,609,797	189,728
Total	95,455,250	5,194,767	64,548,664	3,680,710

The per cent of the importation from Turkey of the whole importation is as follows: Of quantity, 67.6 per cent, and of value, 70.8 per cent. The average value at the port of export from all countries is 5.4 cents per pound; the average value of figs from Turkey in Asia is 5.7 cents per pound. Add to this cost the present tariff of 2 cents per pound and the freight to the United States, and the result is a substantial basis upon which to estimate the profitable production of figs in the sections of this country adapted to their culture.

It must be remembered that the value on invoice values at the port of export average 5.7 cents, but the sales in New York at auction show that figs bring at auction all the way from 9 cents to 28 and 50 cents per pound.

The small quantity of figs imported in 1899, as shown by the following table, is probably due to their shipment to England and thence to the United States:

Table showing countries from which figs were exported to the United States, with quantity and value, in the fiscal year 1898–99.

Countries.	Quantity.	Value.
	Pounds.	
Belgium	553,075	$13,195
France	34,774	4,149
Greece	161,254	4,089
Italy	635,026	22,139
Portugal	43,327	1,083
Spain	91,343	2,471
United Kingdom	4,123,238	118,411
Dominion of Canada	24,795	849
Mexico	757	49
West Indies	800	27
Hongkong	20	1
Turkey in Asia	1,609,797	189,728
Turkey in Africa	5,852	571
Total	7,284,058	356,762

The imports of figs from the United Kingdom for the fiscal year ending June 30, 1899, were 4,123,238 pounds; value, $118,411. The imports for 1898 were 2,242,231 pounds; value, $86,684. For 1897, 1,182,246 pounds; value, $75,451.

It will be seen, however, that the amount of figs imported show a varying decrease since 1896, probably due to the progress of fig culture in California, from which State were exported to the East by rail in 1899 over 500 carloads.

CHAPTER XVIII.

HOUSEHOLD RECIPES.

Few fruits have been so neglected in this country as the fig, and, except in some of the Southern States and in southern California, the practical value of figs is almost unknown. What dried figs are sold at the fruit stands and in the grocery stores go principally to the tables of the wealthy merely as a luxury. In the Mediterranean countries the use of the fig is a very different one. There the fig is a staple article of food for the common people, and hundreds of thousands of tons are yearly consumed, as we do wheat and corn. The failure of the fig crop would be a serious matter, indeed, as a large part of the population depends upon the fig as a winter food. Without expecting or desiring any similar conditions to find place in this country, the author believes that, if the true value of the fig and the many uses to which it could be put were known, fig culture would be greatly extended, and a very large trade would spring up, beneficial to the grower, the carrier, the consumer, and the whole country.

The fig is one of the most nourishing of all fruits, and if properly prepared would be considered a most delicious one. Canned figs, stewed figs, fig sauce, etc., are in many places, even in this country, eaten daily in many families and highly valued. Canned figs especially are very fine, and if properly put up by our canneries would soon find a market in northern and eastern countries, where the figs are as yet almost counted among fabled fruits. For the benefit of those who wish to try figs in different ways, the following recipes have been collected, and nearly all of these have been tried by the writer:

Steaming figs.—This should be done always in closed but not tightened jars. Families may best use a common wash boiler, furnished with a loose inner perforated bottom of tin or galvanized iron. kept from the bottom by four stout legs soldered to the loose bottom. The space below the bottom is nearly filled with water. The jars, with fresh figs, are placed above, and finally over the boiler is put its regular cover. This is a much better way than boiling the figs in kettles of any kind over direct fire, as it prevents burning or mashing of the figs, saves handling, preserves the flavor, etc.

Preserved figs.—Gather the figs with the stems on just before they are ripe enough to be eaten. Scrape off the skin carefully and drop the figs into a kettle of clear, boiling water. and leave half an hour. Then take out and allow to cool with the stems up. Make a sirup of a pound and a half of sugar and a half pint of water to each pound of fruit. Boil the sirup till nearly roping; put in the figs carefully and keep them under the water while cooking. If other than the natural flavor is desired. put a clove in the blossom end of each fig or cook them with a sliced lemon from which the seeds have been removed, adding a little ginger. The preserves keep well if made with an equal weight of sugar and figs.

Preserved figs with ginger.—Ten pounds of fresh ripe figs, not shriveled, are peeled of the thick outside skin. As not all figs are peeled readily, a variety which peels must be selected. Take the peel of one orange or lemon, pare well, and use none of the inner white part or rag. Take one ginger root and shave very thinly with a sharp knife. Boil the peel and ginger until very tender in a separate kettle. In another kettle make a sirup of 6 pounds of best white sugar, enough water to dissolve; add the juice of four oranges and one lemon or four lemons. When ready, add the decoction of the orange peel and ginger, but take care to first strain. Bring the sirup to a simmer, drop in the peeled figs and simmer under cover until clear and tender, which requires more or less time, according to the variety of figs used and their state of ripeness.

Pick before quite ripe, peel and put in shallow dishes, with sugar, for twelve hours, usually overnight; drain off juice into preserving kettle, and after coming to a boil put in figs for a short time; take up in dishes again and expose to sun while sirup is boiling down; then return figs, and when they begin to look clear take up and expose to sun again while reducing sirup to desired thickness; then return figs to sirup and let simmer gently for an hour, being careful not to have too hot a fire and thus burst the figs; use a pound of sugar for each pound of fruit.

Pick figs fully ripe, but not shriveled. Scald first in hot water, change water several times in order to draw out the milky juice. Pack figs in glass jars in rows and handsomely. Make a sirup of one cup sugar to two of water. Pour over figs, and steam for twenty minutes, without rubber band. Then place on the rubber bands; steam for twenty-five minutes more with the cover lightly pressed down. A very superior article is made if the figs are first steamed in a colander until tender, then packed in glass and steamed with the sirup. An apricot kernel or a bitter almond may be added to each jar, or, better, grated and boiled with the sirup before pouring over the figs. No more than one kernel is needed for each jar.

Fig preserves.—Gather the fruit when fully ripe, but not cracked open; place in a perforated tin bucket or wire basket and dip for one moment into a deep kettle of hot and moderately strong lye (some prefer letting them lie an hour in lime-water, and afterwards drain); make a sirup in proportion of 1 pound of sugar to 1 of fruit, and when the figs are well drained put them in the sirup and boil them until well cooked; removing, boil the sirup down until there is just enough to cover the fruit; put the fruit back in the sirup, let all boil, and seal while hot in glass or porcelain jars.

Canned figs.—To 3 quarts boiling water add 2 heaping tablespoonfuls soda; now dip your figs in the water for one minute and skim them out; then wash them thoroughly in two or three waters, or until there is no color left in the water. To 10 pounds of figs allow 8 pounds of sugar; add just enough water to dissolve the sugar; when boiling hot, drop in the figs, having first selected them with care so as to avoid any that are broken or overripe; let them simmer slowly two hours; now remove the figs and boil down the sirup until quite thick; replace the figs; bring all to a boiling heat, after which they are ready for canning after the usual method. A few slices of lemon with its juice will improve its flavor.

White-fig marmalade.—A delicious marmalade is made from white figs. Take perfectly ripe and fresh figs, peel off the thin, soft skin, and to every 2 pounds of figs use 1½ pounds of sugar and the grated peel of a large orange or lemon; cut up the figs and mash them with the sugar, adding the grated yellow rind and juice of the orange or lemon; boil all together until the whole is reduced to a thick, clear, smooth mass, stirring frequently from the bottom. When done, put into jars while hot and cover closely.

Those who like less sugar can use one-half pound of sugar to a pound of fruit, and it will keep perfectly, provided it be boiled very clear and smooth.

Fig pudding.—Two pounds of dried figs, 1 pound of suet, one-half pound of flour, one-half pound of bread crumbs, 2 eggs, spices to taste, one-fourth pound of candied lemon peel, one-fourth pound of brown sugar, milk.

Mode: Cut the figs into small pieces, also the lemon peel; grate the bread finely and chop the suet very small: mix these well together; add the sugar, spice, and flour; the eggs should be well beaten, and sufficient milk to form the whole into a stiff paste; butter a mold, press the pudding into it very closely and tie it down with a cloth, and boil four hours or rather longer; turn it out of the mold and serve with lemon sauce, wine sauce, or cream. Sufficient for seven or eight persons. Suitable for a winter pudding, as it should be made with the dried white fig.

Beat one-half pound of sugar and one-fourth pound of butter to a foam. Add yolk of 3 eggs, one-half pound of finely chopped figs, one-half pound of grated bread crumbs, one-half cup of milk, pinch of salt, white of 3 eggs beaten stiff. Boil all for three hours. Serve with white wine or hard sauce.

Chop one-half pound of figs very fine. Mix with 2 tablespoonfuls of butter and add one-third cup of powdered sugar, 2 eggs beaten lightly without separating yolks from the whites, 1 cup of milk, one-fourth cup of cake crumbs. Mix well and turn into a well-pressed mold and boil for three hours.

Stuffed figs.—Use "bag figs" which have not been pressed. Cut a small slit in the stem end of each fig and work in 2 or more blanched almonds.

Another mixture which is very palatable is a paste made from almonds, walnuts, and hickory nuts, to which are added a few drops of sherry. A portion of the soft meat of the figs is first taken out, using a knife or a small pointed spoon. The fig is now filled with the paste. When filled, press the opening and roll in granulated sugar.

Fig tart.—Select a dozen choice dried figs and stew them in enough water to cover them. Add 2 cloves, a small piece of stick cinnamon, and a piece of preserved ginger, chopped fine. When tender, take out the figs and remove the spices. Add enough sugar to the water to make a good sirup and a couple of spoonfuls of ginger sirup. Then boil for five minutes, and add a little hot water if it gets too thick. Next add a teaspoonful of lemon juice and a spoonful of brandy. Return the figs to the sirup and set aside to cool. Put 1 or 2 figs and a spoonful of the sirup in each tart shell before serving.

Whip one-half cup of rich cream until stiff, and sweeten slightly. Add one-half cup of dried figs, cut fine, preferably into minute dices, by aid of a sharp knife. Stir these very lightly into the cream and sugar a few at a time. Fill puff-paste shells with the mixture and sprinkle with maple sirup or dust with cinnamon, according to taste.

Fig marmalade.—Use only fully ripe figs. When they are considerably wilted they are cut. Cut in halves and scrape out the inside pulp; mash and strain through a very coarse sieve. Put into a glazed dish and place the latter in boiling water. Boil constantly for one-half hour and then preserve in sealed glass jars, like canned fruit. This marmalade is very fine; can be eaten with meat or alone with cream. It is a fine relish if made from good, sweet figs.

Fig jam.—Boil sweet dried figs with some sirup till all the juice is thick and sirupy, then run figs, sirup and all, through some kind of a mill that will grind it into a paste. A small sausage grinder is best—one that grinds fine. This paste is fine for use wherever a jam can be used, and can be made more easily than any jam or jelly.

Fig paste.—(1) Pick the figs fully ripe, split and scrape off the pulp, mash and strain and let come to a boil, constantly stirring. To 10 pounds of fig pulp add 1 pound grated cocoanut and the juice of one lemon. After boiling a half hour spread on plates and dry in the sun. When fully dried keep in air-tight place if possible. When ready to use soak in warm water overnight and boil in the same water.

(2) Figs must be very ripe. Wash in water, steam in colander for a few minutes, then rub through a sieve, using best rubber gloves on the hands. The rubber gloves must have been previously washed several times in hot water in order to remove the taste of the rubber. The mushy pulp is then placed in jars and steamed for forty-five minutes or more. If not sweet, add sugar to taste, spread the mush on glass or marble to dry in the sun or in heated air. Fig sauce is made in the same manner, except that it is preserved in jars while yet mushy instead of drying in the sun.

(3) Pick the figs when well ripened, but not so soft as to be difficult to handle Peel them, weigh, and allow three-fourths of a pound of best granulated sugar to 1 pound of fruit. Mix sugar and fruit thoroughly with your hands, or by mashing together with a large potato masher, and let the mixture stand overnight. Prepare the afternoon before if the weather is very hot, but if it is not they can stand from one forenoon to the next. In the morning put them on the back of the stove and let the paste heat slowly, stirring occasionally. Then when ready to give it your whole attention pull forward and "cook down" over a rather slow fire, stirring and mashing almost constantly. There must not be a single lump left in the mass. If wished, some of the seeds which rise and accumulate on the sides of the preserving kettle may be skimmed out. The amount of "cooking down" done is according to taste. The paste is nicer when cooked down a good deal, but if one does this great care must be taken not to burn the paste at the last, when it is quite thick. It is so rich that for small families it had perhaps better be put into pint or half-pint jars.

Figs and grapes preserved together.—White figs and Muscat grapes are sometimes preserved together, the second crop of figs coming in season to can with the grapes.

Pick the figs when their skins begin to crack; peel, weigh, and allow one-half pound of best granulated sugar to 1 pound of the fruit. Mix the fruit and sugar carefully (not breaking the figs), and let stand overnight. In the morning cook slowly on the back of your stove, stirring carefully at intervals. In the morning also prepare your Muscat grapes by picking them from their stems, washing, weighing, and allowing one-fourth pound of sugar to 1 pound of fruit (and as many grapes by weight as figs). Cook in another kettle, using only a very little water—just enough to keep them from burning. They will cook, after starting to boil, in about ten minutes. The figs will need cooking nearly an hour. When both fruits are done, mix carefully together, let come to a boil, and can.

Pickled figs.—Seven pounds of figs picked just before shriveling, 3 pounds of white sugar, 1 quart of vinegar, 1 teaspoonful of salt, 1 teaspoonful of allspice, 1 teaspoonful of ginger, 1 tablespoonful of cloves, 2 tablespoonfuls of cassia buds. Boil together for four hours, put spices in a thin bag to keep pickles clear, and more vinegar if too much evaporates, and add the sugar when nearly ready. When the sugar is dissolved, add the figs. Simmer until tender.

To 10 pounds of figs take 4 pounds brown sugar, 1 quart strong vinegar, 1 large cup of whole spices of the following kinds: Cloves, cinnamon, allspice, and cassia buds. Boil vinegar, sugar, and spices first, and when sugar is well dissolved add the figs and boil until tender. The figs should have been picked before being shriveled. Put all in jars; pour out the liquid for three mornings, and let come to a boil and return to the figs; then close the jars.

Spiced figs.—Peel ripe white figs, and to 10 pounds of the figs add 5 pounds of brown sugar, 1 quart of vinegar, 1 ounce of cinnamon, one-half ounce allspice, one-half ounce cloves, the spices to be tied in bags and boiled with the sugar and vinegar. When the vinegar and spices have come to a boil add the figs, a few at a time, to prevent mashing, and boil until they look clear. When all are done put into jars and pour the vinegar over them hot.

Sweet pickled figs.—The figs are picked when ripe, but must not be soft. Steam first until slightly soft, then place in a liquor made as follows: A sirup is made of a cup of sugar: to every cup of water add a teaspoonful of cider vinegar, one stick of cinnamon, crushed in small pieces. Boil the liquor. Insert a clove in the eye of each fig and pack in a glass jar. Pour the filtered liquor over the figs. Steam the jars first with the cover on loosely for twenty-five minutes. Then place on the rubber bands, screw down cover lightly, and steam for twenty minutes more.

Crystallized figs.—The figs must be picked when fully ripe, but before they are shriveled. Take figs of as even a size as possible in order to save assorting afterwards. Simmer in a kettle for twenty to thirty minutes, but do not allow to boil. When ready the figs will have become clear and semitransparent. Drain off the water. Prepare a strong sirup of best white sugar and drop the figs in. Keep this in a cool place. In from twenty-four to thirty-six hours the figs will have absorbed most of the sugar and the sirup become very weak. Draw off the sirup, add more white sugar, and thus make the sirup stronger. Simmer, but do not boil. Drop the figs in and test again in twenty-four hours. If the sirup is weak renew the process. When the sirup retains its strength, the process is discontinued. Prepare a very strong sirup of best white sugar; simmer, but do not boil. Previous to this the figs are dried in the sun or in drier until they slightly ring when dropped on a stone floor. The figs should, however, not be so dry that they can not be readily indented when pressed between the fingers. Now immerse these dried figs for a few seconds in the strong, hot sirup, then drain off and place on wire trays in a hot-air drier or in the hot sun, if on a warm day. The sirup dries quickly and leaves the figs glacéd. If crystallized figs are wanted, the figs are slowly dried in the shade, in which case the sirup crystallizes instead of producing a glacé.

Candied figs.—Are made only from young green figs not yet fully ripe. Place in glass jars, pour on salt water, and steam until soft. Pour off the salt water and pour over a sirup made of one cup of sugar to three of water. After a day take out, place on wire screens, and allow to drip for one or two days in a warm place. Place again in jars or earthenware; cover with a sirup made of one cup of sugar to one and one-half cups of water. After a day take out and allow to drip. The third soaking should be in a sirup made of one cup of sugar to one-half cup of water. In this sirup the figs are allowed to remain as long as possible, or until required. Take out, drip, and roll in confectioners' powdered white sugar in a pan made lukewarm. When the figs have absorbed all the sugar they can they are taken out and packed in large boxes with powdered sugar. The preserved fruit is afterwards repacked in small boxes for the market.

CHAPTER XIX.

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CHAPTER XX.

TABLES OF TEMPERATURE, PRECIPITATION, AND HUMIDITY IN THE PRINCIPAL FIG REGIONS.

The following tables have been compiled for this bulletin by the Weather Bureau of the United States Department of Agriculture. As the temperatures are given in degrees centigrade and Fahrenheit, a table is appended showing the relative value and corresponding degrees of the three principal thermometers in use. Precipitation is expressed in inches or millimeters. In order to reduce inches to millimeters multiply the given number of inches by 25, or, to be more accurate, divide the given number of inches by 4 and then multiply by 99. On the contrary, in reducing millimeters to inches divide the given number of inches by 25, or, to be more accurate, divide by 99 and multiply the quotient by 4. As 4 inches equal about 99 millimeters, the difference between the first method and the second is so slight as to be of little importance, making a difference of but three-fourths inch in 25 inches. The localities in the Old World have been selected as being representative places where figs are successfully grown. From Portugal no records have been obtainable. The localities in the United States have been selected, not because they are actually prominent fig districts, but in order to give a general idea of the conditions under which fig culture is practiced in this country. It is safe to say that the ideal fig districts in America have not yet been determined. Localities which as much as possible resemble the climatological conditions of the southern Mediterranean countries will probably be found to be the most suitable for the fig industry.

Table for comparison of thermometers.

Fahrenheit.	Centigrade.	Reaumur.	Fahrenheit.	Centigrade.	Reaumur.
212	100.0	80.0	168	75.6	60.4
210	98.9	79.1	166	74.4	59.6
208	97.8	78.2	164	73.3	58.7
206	96.7	77.3	162	72.2	57.8
204	95.6	76.4	160	71.1	56.9
202	94.4	75.6	158	70.0	56.0
200	93.3	74.7	156	68.9	55.1
198	92.2	73.8	154	67.8	54.2
196	91.1	72.9	152	66.7	53.3
194	90.0	72.0	150	65.6	52.4
192	88.9	71.1	148	64.4	51.6
190	87.8	70.2	146	63.3	50.7
188	86.7	69.3	144	62.2	49.8
186	85.6	68.4	142	61.1	48.9
184	84.4	67.6	140	60.0	48.0
182	83.3	66.7	138	58.9	47.1
180	82.2	65.8	136	57.8	46.2
178	81.1	64.9	134	56.7	45.3
176	80.0	64.0	132	55.6	44.4
174	78.9	63.1	130	54.4	43.6
172	77.8	62.2	128	53.3	42.7
170	76.7	61.3	126	52.2	41.8

Table for comparison of thermometers—Continued.

Fahrenheit.	Centigrade.	Reaumur.	Fahrenheit.	Centigrade.	Reaumur.
124	51.1	40.9	32	0.0	0.0
122	50.0	40.0	30	− 1.1	− 0.9
120	48.9	39.1	28	− 2.2	− 1.8
118	47.8	38.2	26	− 3.3	− 2.7
116	46.7	37.3	24	− 4.4	− 3.6
114	45.6	36.4	22	− 5.6	− 4.4
112	44.4	35.6	20	− 6.7	− 5.3
110	43.3	34.7	18	− 7.8	− 6.2
108	42.2	33.8	16	− 8.9	− 7.1
106	41.1	32.9	14	−10.0	− 8.0
104	40.0	32.0	12	−11.1	− 8.9
102	38.9	31.1	10	−12.2	− 9.8
100	37.8	30.2	8	−13.3	−10.7
98	36.7	29.3	6	−14.4	−11.6
96	35.6	28.4	4	−15.6	−12.4
94	34.4	27.6	2	−16.7	−13.3
92	33.3	26.7	0	−17.8	−14.2
90	32.2	25.8	− 2	−18.9	−15.1
88	31.1	24.9	− 4	−20.0	−16.0
86	30.0	24.0	− 6	−21.1	−16.9
84	28.9	23.1	− 8	−22.2	−17.8
82	27.8	22.2	−10	−23.3	−18.7
80	26.7	21.3	−12	−24.4	−19.6
78	25.6	20.4	−14	−25.6	−20.4
76	24.4	19.6	−16	−26.7	−21.3
74	23.3	18.7	−18	−27.8	−22.2
72	22.2	17.8	−20	−28.9	−23.1
70	21.1	16.9	−22	−30.0	−24.0
68	20.0	15.0	−24	−31.1	−24.9
66	18.9	15.1	−26	−32.2	−25.8
64	17.8	14.2	−28	−33.3	−26.7
62	16.7	13.3	−30	−34.4	−27.6
60	15.6	12.4	−32	−35.6	−28.4
58	14.4	11.6	−34	−36.7	−29.3
56	13.3	10.7	−36	−37.8	−30.2
54	12.2	9.8	−38	−38.9	−31.1
52	11.1	8.9	−40	−40.0	−32.0
50	10.0	8.0	−42	−41.1	−32.9
48	8.9	7.1	−44	−42.2	−33.8
46	7.8	6.2	−46	−43.3	−34.7
44	6.7	5.3	−48	−44.4	−35.6
42	5.6	4.4	−50	−45.6	−36.4
40	4.4	3.6	−52	−46.7	−37.3
38	3.3	2.7	−54	−47.8	−38.2
36	2.2	1.8	−56	−48.9	−39.1
34	1.1	0.9			

Temperature and precipitation in fig districts.

SMYRNA, TURKEY.[1]

[Latitude 38° 26′ N.; longitude 27° 10′ E.]

MAXIMUM TEMPERATURE (DEGREES CENTIGRADE).[1]

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
19.6	20.1	24.7	27.8	32.8	35.3	38.1	38.0	33.7	31.4	24.4	20.3	39.6

MINIMUM TEMPERATURE (DEGREES CENTIGRADE).[2]

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
−2.3	−2.8	1.0	4.2	9.5	14.4	15.8	15.6	11.4	7.8	3.0	−1.1	−4.4

MEAN MAXIMUM TEMPERATURE (DEGREES CENTIGRADE).[3]

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
13.4	15.0	18.7	20.1	27.7	30.9	33.3	32.8	29.2	25.4	19.0	14.8	....

[1] Zeitschrift der Œsterreichischen Gesellschaft für Meteorologie, VIII. Band, 1873.
[2] Record for nine years.
[3] Record for seven years.

Temperature and precipitation in fig districts—Continued.

SMYRNA, TURKEY—Continued.

MEAN MINIMUM TEMPERATURE (DEGREES CENTIGRADE).[1]

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
3.7	3.7	7.3	7.7	13.7	17.7	19.9	19.6	16.2	12.7	7.9	5.1	--------

MEAN TEMPERATURE (DEGREES CENTIGRADE).[2]

7.8	8.9	12.6	14.1	20.2	23.6	26.7	25.6	21.9	18.8	13.2	8.9	16.86

MEAN RELATIVE HUMIDITY (PER CENT).[3]

77	71	69	63	60	57	53	58	63	74	76	76	66.4

PRECIPITATION (MILLIMETERS).[4]

115	66	107	32	20	21	8	4	23	39	105	72	612

[1] Record for seven years.
[2] Record for eleven years.
[3] Record for four years.
[4] Record for nine years. One millimeter (mm.) =0.03937 inch, or approximately 0.04 or $\frac{1}{25}$ inch.

The individual values are not obtainable. The record is from the city of Smyrna and not from the fig districts, which are situated farther inland and where the temperature and rainfall must differ somewhat. From the fig districts no records are obtainable.

ATHENS, GREECE.

[Latitude 37° 58′ N.; longitude 23° 44′ E.; elevation 337 feet.]

MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
46.76	48.00	52.39	59.07	67.91	76.01	80.60	80.15	74.16	65.75	57.24	49.77	63.14

ABSOLUTE MAXIMUM (DEGREES FAHRENHEIT).

69.44	73.58	83.12	91.40	100.58	104.54	105.26	105.08	102.74	95.00	80.60	71.42	105.26

ABSOLUTE MINIMUM (DEGREES FAHRENHEIT).

21.74	20.84	20.12	36.14	43.16	55.94	61.16	57.20	47.66	38.48	34.52	26.96	[1] 26.96

MEAN PRECIPITATION (INCHES).

2.07	1.49	1.44	0.75	0.96	0.42	0.29	0.42	0.61	2.09	2.77	2.73	16.06

[1] 14 was recorded in 1850, month not stated.

The data recorded are the means of the 23-year period 1859–1882, and in their appropriate places the extremes of temperature recorded in that period. Individual monthly values not obtainable.

Temperature and precipitation in fig districts—Continued.

ALGER (L'EMPEREUR), AFRICA.[1]

[Latitude 36° 47′ N.; longitude 3° 4′ E.; elevation 223.2 m.]

MEAN TEMPERATURE (DEGREES CENTIGRADE).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	9.2	......	12.8	12.8	17.9	19.6	23.0	26.0	23.3	17.1	13.6	12.3	16.77
1886	9.9	10.5	13.4	14.9	17.9	19.4	22.8	22.6	22.5	18.7	13.9	11.3	16.48
1887	9.7	9.8	12.7	13.8	17.2	21.5	24.6	24.7	22.9	15.3	14.6	10.7	16.46
1888	10.3	8.8	12.2	15.2	17.1	21.0	22.8	22.0	......	18.4	14.8	13.2	16.44
1889	11.0	12.1	13.0	15.2	18.3	21.2	24.5	24.3	22.7	17.6	15.6	11.4	17.24

MAXIMUM TEMPERATURE (DEGREES CENTIGRADE).

1885	19.0	......	28.0	25.0	27.6	29.8	35.0	37.0	37.6	27.0	23.6	22.8	37.6
1886	20.0	18.6	23.0	26.2	33.8	31.7	41.2	36.8	32.2	33.0	24.2	23.2	41.2
1887	18.8	17.8	25.6	31.8	31.0	36.6	42.0	36.4	34.0	30.2	27.5	18.2	42.0
1888	19.2	20.0	28.0	32.6	32.6	32.4	36.6	36.0	......	37.2	23.8	......	......
1889	19.2	22.0	26.5	29.0	29.5	30.0	37.8	34.5	32.5	32.0	24.7	19.2	37.8

MINIMUM TEMPERATURE (DEGREES CENTIGRADE).

1885	2.8	......	3.2	6.0	9.6	13.8	16.2	18.8	14.0	7.6	6.8	6.8	2.8
1886	4.6	2.2	......	6.4	10.4	13.8	17.7	16.8	14.4	10.4	7.8	......	......
1887	2.0	2.4	7.6	6.8	12.0	13.8	17.0	18.8	14.8	5.0	......	1.6	1.6
1888	4.4	0.6	......	......	11.6	......	13.8	13.2	10.4	8.6	......	......	......
1889	2.5	2.0	6.5	8.6	11.4	14.2	18.5	18.3	15.8	12.0	4.8	6.4	2.0

MEAN RELATIVE HUMIDITY (PER CENT).

1885	81	......	75	78	73	78	78	70	69	71	81	76	......
1886	75	78	78	75	71	74	75	78	75	77	76	73	75.4
1887	74	81	80	75	71	75	70	74	73	74	73	84	75.3
1888	83	77	74	76	80	78	73	74	......	67	74	80	76.0
1889	70	62	61	61	66	61	64	72	73	63	69	67	65.8

PRECIPITATION (MILLIMETERS).

1885	101.0	18.0	127.5	179.0	7.0	10.9	4.3	0.2	22.8	90.5	127.9	41.2	733.3
1886	280.5	180.5	93.9	95.7	48.0	0.0	1.7	0.0	29.1	336.1	126.3	241.5	1,433.6
1887	113.9	164.6	101.5	87.6	8.9	26.4	2.1	0.0	75.5	68.8	153.1	176.1	978.5
1888	116.1	145.9	87.9	54.6	59.0	14.1	0.4	6.6	......	91.6	149.7	......	......
1889	207.3	81.5	145.0	85.1	92.2	3.0	1.6	1.2	14.5	75.5	112.1	159.9	978.9

PALERMO, SICILY.[2]

[Latitude 38° 7′ N.; longitude 13° 21′ E.; elevation 71.3 m.]

MEAN TEMPERATURE (DEGREES CENTIGRADE).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1881	14.4	11.7	14.6	17.0	17.2	20.6	25.8	26.4	23.8	19.5	14.4	12.6	18.2
1882	10.6	10.0	13.6	14.5	18.5	22.2	23.9	24.3	22.7	20.2	15.3	13.1	17.4
1883	10.6	11.1	11.3	13.5	17.5	20.8	23.7	23.6	21.6	17.8	15.0	10.6	16.4
1884	10.1	11.2	11.9	15.5	18.3	19.5	23.7	24.2	21.9	18.0	13.6	11.4	16.6
1885	8.8	11.9	13.4	14.4	17.6	21.5	24.5	27.8	23.4	19.2	15.2	10.9	17.4

MAXIMUM TEMPERATURE (DEGREES CENTIGRADE).

1881	23.8	19.0	27.7	31.0	26.3	33.4	41.3	39.0	32.7	30.6	25.9	20.7	41.3
1882	20.9	20.4	28.8	24.6	34.5	35.8	38.1	33.8	35.6	31.2	25.9	23.8	38.1
1883	23.8	19.7	27.0	32.6	32.5	31.4	41.2	33.9	34.5	28.8	25.4	19.7	34.5
1884	18.9	22.6	21.7	29.6	29.0	30.0	36.2	35.4	37.4	28.9	22.8	19.8	37.4
1885	17.4	28.0	31.8	23.3	32.4	33.0	33.3	45.5	36.7	32.8	24.9	23.2	45.5

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[1] Authority: Annales du Bureau Central Météorologique de France, Vol. II, Observations.
[2] Authority: Annali del Ufficio Centrale Meteorologico Italiano, vols. 3, 4, 5, 6, 7.

Temperature and precipitation in fig districts—Continued.

PALERMO, SICILY—Continued.

MINIMUM TEMPERATURE (DEGREES CENTIGRADE).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1881	5.5	3.0	3.4	7.8	6.4	11.0	16.0	17.2	14.0	8.2	5.4	4.2	3.0
1882	2.7	—0.2	4.5	5.2	6.8	12.0	15.4	14.8	11.7	10.7	4.5	4.4	—0.2
1883	—0.9	3.1	—0.4	4.4	6.2	11.0	12.3	13.0	10.3	8.8	6.3	2.1	—0.9
1884	2.1	0.8	3.4	5.2	7.0	9.8	12.9	15.2	12.6	9.7	4.3	3.7	0.8
1885	0.3	0.8	1.8	4.3	5.7	10.8	13.9	17.7	13.9	8.7	7.2	—0.5	—0.5

MEAN RELATIVE HUMIDITY (PER CENT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1881	61	65	59	59	63	62	52	52	58	63	70	74	61
1882	79	73	73	73	72	70	65	68	70	75	73	72	72
1883	77	74	70	75	67	71	70	69	77	78	79	78	74
1884	76	78	78	69	74	68	61	59	65	69	74	76	71
1885	74	69	64	68	63	62	64	58	63	68	77	77	67

PRECIPITATION (MILLIMETERS).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1881	63.9	133.0	41.9	75.0	26.6	51.0	0.0	0.0	27.3	57.1	176.2	121.8	773.8
1882	26.7	39.4	122.9	64.2	7.9	16.1	0.8	0.7	32.0	87.7	50.0	67.7	516.1
1883	143.3	45.9	179.5	77.1	17.5	3.7	1.4	83.8	115.8	85.1	64.1	138.4	955.6
1884	34.3	20.4	43.3	73.6	57.9	38.9	24.0	0.7	9.7	87.6	118.2	79.8	588.4
1885	131.9	63.1	34.8	76.5	5.0	0.5	4.6	5.7	39.2	127.7	117.3	103.1	709.4

VALENCIA, SPAIN.[1]

[Latitude 39° 28′ N.; longitude 0° 22′ W.]

MEAN TEMPERATURE (DEGREES CENTIGRADE).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	6.6	13.6	11.7	13.0	17.4	19.4	22.9	24.3	20.6	16.0	14.3	10.6	15.9
1886	8.9	9.3	13.7	13.5	15.9	18.3	21.0	21.6	18.6	18.1	12.3	11.1	15.2
1887	8.8	7.1	13.5	11.8	15.2	20.2	22.8	25.2	22.6	15.9	13.9	10.2	15.6
1888	10.0	7.8	11.7	14.5	18.5	22.0	23.7	23.6	20.8	17.7	14.0	10.9	16.2
1889	8.5	10.6	11.4	14.0	17.3	21.2	24.1	24.7	24.1	18.6	14.7	8.1	16.4

MAXIMUM TEMPERATURE (DEGREES CENTIGRADE).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	18.0	25.5	26.5	27.0	32.0	30.5	33.0	37.0	32.0	27.0	22.0	20.0	37.0
1886	19.0	19.0	25.5	24.5	32.0	30.0	37.0	30.0	35.0	31.0	23.0	24.0	37.0
1887	21.5	18.0	26.0	25.5	27.0	33.0	32.0	38.0	33.0	26.5	25.0	27.0	38.0
1888	21.0	19.0	25.0	31.0	27.0	32.0	33.0	36.0	34.0	34.0	25.0	19.0	36.0
1889	19.0	28.0	21.0	24.0	28.0	33.0	34.0	40.0	35.3	30.0	25.6	17.2	40.0

MINIMUM TEMPERATURE (DEGREES CENTIGRADE).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	—7.0	6.0	2.0	3.0	6.0	11.0	13.0	14.0	9.0	8.0	7.0	2.0	—7.0
1886	0.0	0.0	4.0	4.0	5.0	7.0	7.0	13.0	5.0	6.0	2.0	—3.0	—3.0
1887	—5.0	—6.0	1.0	1.0	5.0	9.0	9.0	14.0	11.0	3.0	4.0	—1.0	—6.0
1888	—3.0	—2.0	0.0	5.0	10.0	13.0	15.0	16.0	13.0	8.0	2.0	3.0	—3.0
1889	—1.0	—2.0	1.0	4.0	8.0	11.0	15.0	13.0	14.0	9.0	—1.1	—0.8	—2.0

MEAN RELATIVE HUMIDITY (PER CENT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	71	67	71	66	62	68	62	64	58	58	65	72	66
1886	62	63	71	70	64	64	60	62	64	66	70	66	66
1887	69	70	72	69	66	64	64	64	70	65	70	72	68
1888	74	69	67	71	66	60	62	60	76	72	70	76	68
1889	72	63	60	62	69	63	62	64	68	68	74	69	66

PRECIPITATION (IMILLIMETERS).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	65	19	125	90	2	183	2	3	107	29	2	60	687
1886	17	5	76	13	21	8	39	8	40	65	106	2	400
1887	11	74	41	106	36	17	57	17	133	33	62	89	676
1888	25	2	25	81	2	35	2	0	169	63	0	74	478
1889	51	20	2	2	32	37	8	1	45	20	80	30	328

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[1] Resumen de las Observaciones Meteorológicas de Provincias.

Temperature and precipitation in fig districts—Continued.

MALAGA, SPAIN.

[Latitude 36° 43′ N.; longitude 4° 26′ W.]

MEAN TEMPERATURE (DEGREES CENTIGRADE).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	11.1	15.2	14.7	15.5	21.3	23.1	25.1	26.7	23.5	18.5	15.9	13.4	18.7
1886	10.8	13.5	17.3	17.1	20.2	23.7	26.2	26.4	24.9	19.6	14.6	13.5	18.9
1887	11.9	11.2	14.5	15.0	18.3	22.7	25.2	25.8	22.6	17.3	15.4	12.4	17.7
1888	12.1	11.1	13.6	15.2	18.8	22.8	24.3	23.8	22.3	19.5	15.7	13.9	17.7
1889	11.0	13.1	13.1	15.4	18.2	20.5	25.5	25.8	23.0	18.3	16.2	11.6	17.6

MAXIMUM TEMPERATURE (DEGREES CENTIGRADE).

1885	18.4	23.6	22.8	26.0	32.1	33.1	33.2	37.2	33.7	29.6	25.8	23.4	37.2
1886	18.8	22.8	26.2	28.0	31.9	36.0	39.0	38.0	34.8	32.0	25.9	22.1	39.0
1887	20.2	20.1	28.4	24.4	28.9	35.8	35.7	35.0	28.8	25.1	23.5	18.1	35.8
1888	19.5	20.1	23.1	23.9	26.9	35.2	35.9	37.5	30.0	29.1	21.1	19.8	37.5
1889	18.2	26.4	24.9	25.0	28.4	26.5	36.2	36.0	29.9	28.0	21.1	17.8	36.2

MINIMUM TEMPERATURE (DEGREES CENTIGRADE).

1885	0.0	8.2	7.3	6.7	11.3	16.1	15.0	16.4	13.2	8.4	6.8	6.1	0.0
1886	2.9	3.3	8.8	8.5	12.0	14.9	17.1	19.4	16.1	10.8	8.0	5.0	2.9
1887	4.2	3.9	5.5	6.9	11.9	16.4	20.4	20.9	14.5	8.7	7.6	2.5	2.5
1888	2.8	3.0	5.8	9.3	13.4	16.0	18.2	19.0	16.6	13.0	8.9	7.7	2.8
1889	3.4	4.9	5.4	8.5	11.9	13.6	19.4	20.0	16.9	11.0	5.1	5.4	3.4

MEAN RELATIVE HUMIDITY (PER CENT).

1885	70	74	66	62	56	60	60	62	64	65	72	81	66
1886	67	66	66	66	56	54	60	66	66	73	72	68	65
1887	68	65	72	66	67	58	63	66	64	64	74	74	67
1888	78	62	70	70	66	59	60	60	72	71	74	82	68
1889	74	68	71	68	71	66	61	63	71	67	68	70	68

PRECIPITATION (MILLIMETERS).

1885	44	66	141	61	0	61	0	25	14	20	91	249	775
1886	88	22	19	77	2	0	6	1	5	42	112	24	398
1887	33	3	64	92	41	0	0	8	67	8	154	175	605
1888	67	21	80	163	4	0	3	0	31	26	115	119	629
1889	109	40	77	48	34	42	0	0	79	102	0	64	595

SEVILLA, SPAIN.[1]

[Latitude, 37° 23′ N.; longitude, 6° 1′ W.; elevation, — feet.]

MEAN TEMPERATURE (DEGREES CENTIGRADE).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	10.7	15.9	15.0	15.4	22.2	23.1	25.4	28.1	26.8	20.3	17.3	14.4	19.5
1886	12.2	14.1	17.9	17.9	21.7	25.9	30.2	30.4	26.6	20.3	15.8	12.7	20.4
1884[2]	13.0	14.1	15.9	16.0	22.1	25.3	29.4	31.4	25.5	20.4	16.8	11.4	20.1
1888	11.5	9.7	13.8	16.1	22.5	25.5	28.1	28.6	25.7	20.3	15.1	12.6	19.1
1889	9.9	12.6	13.8	15.9	20.1	22.9	28.5	29.2	26.2	18.5	16.0	9.2	18.6

MAXIMUM TEMPERATURE (DEGREES CENTIGRADE).

1885	22.6	27.0	29.0	26.0	37.8	37.6	42.0	46.8	44.8	37.0	30.0	26.4	46.8
1886	26.0	26.8	28.0	28.8	38.6	42.0	46.8	45.0	43.8	35.8	31.0	23.6	46.8
1884[2]	25.6	26.0	29.8	29.8	36.6	42.0	44.4	47.0	43.0	39.0	30.0	22.0	47.0
1888	20.0	21.0	23.4	28.0	37.0	40.0	42.0	42.2	39.0	32.0	25.0	20.6	42.2
1889	19.0	28.0	26.0	28.0	33.0	39.6	42.0	43.0	40.4	29.0	26.0	21.0	43.0

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[1] Authority: Resumen de las Observaciones Meteorológicas de Provincias.

[2] Data for 1884 used instead of 1887.

Temperature and precipitation in fig districts—Continued.

SEVILLA, SPAIN—Continued.

MINIMUM TEMPERATURE (DEGREES CENTIGRADE).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	—4.2	5.6	4.4	5.8	8.4	14.4	12.0	15.0	10.2	5.8	4.4	3.4	—4.2
1886	0.0	0.0	5.8	4.0	8.6	11.8	16.4	16.6	13.0	7.0	3.8	—0.8	—0.8
1884[1]	1.0	3.0	4.6	4.0	6.8	12.0	16.0	15.0	13.6	8.0	0.4	—0.8	—0.8
1888	—1.0	—1.2	3.0	6.0	10.0	13.2	15.4	15.6	14.6	9.0	5.2	3.0	—1.2
1889	—0.2	0.0	3.6	5.4	9.0	9.0	16.0	16.6	14.6	7.4	0.0	—1.4	—1.4

MEAN RELATIVE HUMIDITY (PER CENT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	83	82	74	78	68	64	56	56	63	77	84	88	70
1886	84	84	80	68	55	56	58	47	59	72	76	81	68
1884[1]	81	84	80	78	58	58	50	56	64	67	75	78	69
1888	82	76	81	78	70	66	50	56	66	72	78	84	72
1889	84	79	77	76	70	60	50	51	62	74	70	72	68

PRECIPITATION (MILLIMETERS).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	41	180	61	102	0	101	0	42	24	37	186	42	817
1886	57	18	31	43	11	0	3	0	26	29	76	113	408
1884[1]	8	36	31	90	5	14	0	0	23	36	30	63	336
1888	84	26	145	147	18	5	0	0	16	67	79	141	728
1889	41	62	123	60	77	16	0	1	57	22	5	9	473

[1] Data for 1884 used instead of 1887.

COSENZA, ITALY.[1]

[Latitude, 39° 19′ N.; longitude, 16° 17′ E.; elevation, 255 meters.]

MEAN TEMPERATURE (DEGREES CENTIGRADE.)

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1881	8.9	6.8	10.6	13.7	15.7	20.1	25.9	25.8	20.2	15.1	9.9	8.0	15.1
1882	6.1	5.7	11.2	11.4	17.6	22.2	24.3	23.6	20.8	17.0	11.9	8.4	15.0
1883	6.2	7.7	8.3	11.9	16.9	22.7	25.4	22.6	19.9	14.5	11.0	5.9	14.4
1884	4.7	6.3	9.2	12.7	17.6	17.6	22.6	22.5	18.6	13.8	7.0	7.1	13.3
1885	4.7	8.9	11.9	12.6	17.2	20.5	24.9	27.1	21.0	16.3	11.9	6.9	15.3

MAXIMUM TEMPERATURE (DEGREES CENTIGRADE.)

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1881	18.0	13.8	26.0	24.8	27.0	33.0	36.5	32.0	32.5	23.0	18.0	16.0	36.5
1882	14.2	17.0	22.4	24.0	30.2	33.0	37.4	31.0	31.5	27.0	19.8	17.5	37.4
1883	14.0	15.0	19.8	21.2	30.0	33.0	37.8	31.0	31.0	24.8	20.4	15.2	37.8
1884	13.6	15.4	19.0	23.2	28.0	27.5	36.2	32.0	32.0	25.0	17.0	15.2	36.2
1885	12.8	21.7	26.0	22.6	27.0	32.4	35.2	39.4	33.0	27.0	18.8	17.4	39.4

MINIMUM TEMPERATURE (DEGREES CENTIGRADE.)

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1881	0.2	−1.7	−0.8	3.0	5.0	8.3	15.0	14.2	9.8	5.0	3.2	0.8	−1.7
1882	0.0	−1.6	5.0	2.0	8.3	11.8	14.0	15.0	12.0	9.8	3.8	0.8	−1.6
1883	−6.0	−0.2	−2.1	3.2	7.0	12.0	14.0	12.6	11.0	6.0	4.2	−1.6	−6.0
1884	−1.8	−0.6	3.0	5.0	8.0	10.6	11.0	12.2	9.3	4.0	−1.6	1.0	−1.8
1885	−3.8	−1.0	3.0	5.0	8.6	12.4	15.6	18.0	11.0	5.4	4.4	−5.6	−5.6

MEAN RELATIVE HUMIDITY (PER CENT.)

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1881	72	74	75	74	73	71	64	63	62	68	73	74	70
1882	73	72	73	72	76	71	71	71	72	74	73	75	73
1883	75	75	73	73	73	71	71	68	67	64	70	72	71
1884	76	73	75	76	74	72	70	68	69	70	73	79	73
1885	79	76	72	72	71	69	67	63	62	65	72	72	70

PRECIPITATION (MILLIMETERS).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1881	479.7	174.9	59.1	112.6	104.6	89.3	29.6	40.0	86.8	219.3	91.8	186.5	1,674.2
1882	29.1	60.0	51.6	99.8	19.6	6.2	5.1	10.8	105.4	117.3	166.9	264.6	936.4
1883	68.8	61.6	156.8	203.4	70.6	6.8	0.4	102.6	82.5	152.8	85.6	190.4	1,182.3
1884	58.4	49.2	49.4	122.6	14.0	69.9	21.5	66.0	18.6	109.3	150.1	112.8	841.8
1885	223.1	75.3	118.0	152.8	42.6	82.9	13.0	11.0	138.2	210.5	167.2	69.6	1,304.2

[1] Authority: Annali del Ufficio Centrale Meteorologico Italiano, vols. 3, 4, 5, 6, 7.

Temperature and precipitation in fig districts—Continued.

MARSEILLES, FRANCE.[1]

[Latitude 43° 17′; longitude 5° 22′ E.; elevation 75 m.]

MEAN TEMPERATURE (DEGREES CENTIGRADE).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	5.4	10.0	10.2	11.8	15.6	20.0	23.5	22.7	18.0	12.3	10.9	7.4	13.98
1886	5.7	6.7	9.0	13.0	16.9	19.1	22.6	21.6	20.2	16.4	10.1	6.5	13.98
1887	4.5	6.2	8.9	11.4	15.0	20.7	23.9	22.4	17.8	10.2	9.4	5.8	13.02
1888	5.4	4.1	8.1	11.7	17.3	19.8	20.2	19.6	19.1	12.2	11.0	8.9	13.12
1889	6.0	5.1	7.6	11.3	16.2	21.0	22.0	20.8	18.0	14.2	9.6	4.7	13.04

MAXIMUM TEMPERATURE (DEGREES CENTIGRADE).

1885	14.6	17.6	20.1	23.7	29.8	29.1	35.3	34.8	30.1	24.1	21.2	19.8	35.3
1886	14.8	16.1	21.0	24.8	29.0	28.0	33.5	31.4	31.7	27.1	20.9	18.1	33.5
1887	16.6	16.8	21.0	24.0	26.5	31.2	34.1	33.7	29.2	21.7	16.8	16.6	34.1
1888	15.3	......	19.5	24.1	27.3	28.9	30.0	31.2	28.5	23.0	20.0	17.3	31.2
1889	15.7	18.7	18.6	21.1	28.0	31.2	33.0	30.6	30.9	22.7	20.9	16.0	33.0

MINIMUM TEMPERATURE (DEGREES CENTIGRADE).

1885	−2.1	0.1	−0.7	1.9	6.9	10.1	13.5	11.0	7.4	2.6	1.8	−3.0	−3.0
1886	5.2	−3.2	−1.0	1.6	4.0	10.4	11.0	12.4	8.1	7.6	−1.0	−4.2	−5.2
1887	−6.0	−4.2	−2.8	0.0	2.0	10.2	13.2	9.2	5.0	−1.5	0.6	−9.4	−9.4
1888	−8.0	−4.8	−4.0	−1.0	6.0	10.8	8.5	8.6	10.0	2.0	0.0	−1.0	−8.0
1889	−3.0	−6.0	−3.2	3.0	6.0	13.0	11.8	10.6	7.0	3.5	−2.0	−5.2	−6.0

MEAN RELATIVE HUMIDITY (PER CENT).

1885	76	74	69	70	65	68	67	66	70	72	77	70	70.3
1886	69	71	70	69	65	61	63	65	77	74	79	73	79.7
1887	74	73	70	66	58	60	68	60	72	69	78	66	67.8
1888	71	71	66	64	63	68	68	64	76	72	80	79	69.8
1889	73	61	64	68	75	67	63	61	65	74	71	71	67.6

PRECIPITATION (MILLIMETERS).

1885	61.0	27.9	15.6	122.2	25.5	79.1	1.7	11.6	53.8	143.5	83.6	1.4	621.9
1886	89.1	60.0	54.6	26.4	8.7	15.4	5.4	15.9	136.1	183.6	204.3	19.1	818.6
1887	66.0	110.1	25.8	61.2	21.9	7.2	62.0	34.6	62.4	69.0	101.2	27.5	648.9
1888	9.0	71.5	22.1	24.6	46.0	43.6	32.1	45.1	22.6	5.7	90.3	237.7	650.3
1889	51.2	15.7	32.5	73.5	70.0	15.1	20.3	0.0	0.3	133.3	12.2	26.2	450.3

PARIS, FRANCE.[1]

[Latitude 48° 48′ 28″; longitude 2° 20′ E. Greenwich; elevation 49.3 m.]

MEAN TEMPERATURE (DEGREES CENTIGRADE).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	−0.24	7.10	5.15	10.09	11.21	18.07	18.50	16.16	14.10	8.55	6.21	2.18	9.76
1886	2.21	1.18	5.27	10.47	14.17	15.18	18.30	17.95	16.82	12.38	6.85	2.96	10.31
1887	−0.22	2.16	3.43	8.23	11.38	17.32	19.35	17.30	12.73	6.67	5.03	2.33	8.81
1888	0.93	−0.09	3.84	7.47	13.34	16.35	15.70	16.40	14.56	7.59	8.12	3.18	8.95
1889	1.07	2.37	4.48	8.59	14.65	18.54	17.84	16.80	13.70	9.51	5.86	0.27	9.47

MAXIMUM TEMPERATURE (DEGREES CENTIGRADE).

1885	13.3	17.7	15.4	25.1	30.4	31.4	30.6	31.5	29.1	16.7	15,4	13.5	31.5
1886	10.8	11.0	21.3	26.3	28.6	27.3	33.0	31.4	31.6	25.6	16.5	13.2	33.0
1887	9.1	13.0	15.6	20.3	23.4	30.8	33.2	32.3	23.0	15.7	13.0	13.3	33.2
1888	8 4	8.5	16.3	19.6	27.9	34.5	26.5	30.5	26.7	20.3	15.5	11.9	34.5
1889	10.3	13.5	16.2	20.6	27.0	30.3	30.2	28.2	30.1	17.9	14.9	11.9	30.3

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[1] Authority: Annales du Bureau Central Météorologique de France; Vol. II, Observations.

Temperature and precipitation in fig districts—Continued.

PARIS, FRANCE—Continued.

MINIMUM TEMPERATURE (DEGREES CENTIGRADE).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	—10.9	— 1.6	—3.7	0.3	—0.3	5.5	9.0	5.3	0.7	0.0	—2.7	—6.4	—10.9
1886	— 8.6	— 7.0	—6.5	—0.3	1.3	6.2	5.9	8.0	4.2	4.1	—1.3	—7.3	— 8.6
1887	— 6.9	— 9.7	—7.7	—2.0	2.2	6.9	7.3	5.8	2.1	—4.8	—7.6	—8.8	— 9.7
1888	—11.8	—15.0	—8.8	—2.2	1.6	5.0	6.5	7.5	3.9	—3.0	—0.3	—6.0	—15.0
1889	— 8.6	—10.5	—6.6	0.0	3.8	8.2	7.6	6.9	1.0	0.8	—3.1	—7.5	—10.5

MEAN RELATIVE HUMIDITY (PER CENT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	90.1	80.9	73.2	69.0	70.1	67.4	67.3	67.7	81.5	84.6	86.5	89.2	77.2
1886	85.8	84.4	72.8	70.2	66.6	79.4	73.1	79.2	81.0	85.4	87.5	87.1	79.4
1887	91.1	81.5	77.6	68.2	77.7	70.8	70.1	68.9	80.0	84.7	86.6	87.9	78.8
1888	88.6	87.1	80.8	73.9	65.1	74.9	80.1	78.3	80.7	83.1	86.2	90.1	80.7
1889	88.5	81.2	75.7	74.0	74.0	74.5	72.2	74.6	76.5	85.9	88.0	90.3	80.0

PRECIPITATION (MILLIMETERS).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	23.1	41.9	36.0	35.3	38.5	68.9	14.1	65.9	56.8	105.5	44.0	58.8	588.8
1886	43.1	22.7	55.2	56.1	66.1	93.5	39.6	60.0	48.8	75.9	53.7	65.4	680.1
1887	15.5	3.1	20.3	34.9	75.8	44.2	52.2	89.0	30.2	36.4	47.4	48.2	497.2
1888	26.2	36.3	90.5	53.4	20.1	66.5	81.6	42.7	25.8	34.2	41.6	23.4	542.3
1889	29.3	57.2	28.4	56.2	55.4	46.5	31.5	54.9	25.1	81.6	29.5	36.8	532.4

MELBOURNE, AUSTRALIA.[1]

[Latitude 37° 49′ 53″ S.; longitude 144° 58′ 45″ E.; elevation 91 feet.]

MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	64.2	64.3	61.5	57.2	54.6	48.1	46.2	51.9	53.9	58.0	59.9	65.5	--------
1886	68.0	62.7	61.2	59.1	52.7	49.2	47.5	49.8	55.5	54.6	61.9	63.4	--------
1887	69.2	67.9	65.0	59.5	52.5	49.3	49.6	50.4	51.8	56.8	58.8	66.6	--------
1888	64.9	64.9	60.0	58.1	53.6	52.0	48.4	48.6	54.2	56.1	62.7	66.7	--------
1889	67.7	65.9	64.4	60.5	55.6	52.5	47.8	50.1	52.3	58.9	61.8	64.0	--------

MAXIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	98.4	101.6	95.2	83.6	75.0	62.1	61.2	77.0	75.0	96.1	90.5	95.1	--------
1886	100.0	104.1	98.1	90.2	76.6	63.3	65.1	68.1	78.9	75.5	95.4	96.8	--------
1887	104.9	99.6	93.0	90.6	66.0	65.0	59.9	72.1	73.1	82.1	89.3	94.5	--------
1888	104.0	97.2	94.0	88.9	78.1	66.9	64.2	67.1	80.1	86.0	102.0	96.4	--------
1889	99.2	96.0	96.0	87.9	78.1	66.0	62.1	68.0	74.5	84.5	93.2	99.8	--------

MINIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	42.0	46.1	42.5	40.0	41.2	30.2	29.9	31.7	40.0	36.5	42.1	47.4	--------
1886	48.3	45.9	43.3	37.6	32.7	33.0	28.1	32.9	36.6	38.6	43.8	46.7	--------
1887	47.9	46.7	42.0	41.3	36.8	33.0	34.9	33.6	35.2	38.1	41.5	46.1	--------
1888	48.8	43.1	42.0	34.8	40.0	36.2	28.3	30.0	34.4	35.1	38.1	47.2	--------
1889	49.7	45.5	43.0	37.2	39.4	37.6	31.3	32.1	32.1	37.8	41.3	47.0	--------

MEAN RELATIVE HUMIDITY (PER CENT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	64	67	66	74	73	81	82	65	75	69	67	69	--------
1886	68	68	68	70	72	78	80	74	65	70	65	68	--------
1887	65	66	66	76	84	87	80	80	74	73	71	67	--------
1888	71	64	71	66	80	76	76	75	75	64	64	66	--------
1889	68	67	63	72	77	77	81	75	69	70	70	61	--------

PRECIPITATION (INCHES).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	0.75	2.74	2.39	2.52	1.23	3.63	1.13	1.56	3.93	1.99	3.54	1.53	--------
1886	4.54	1.54	1.72	0.95	0.80	0.81	0.84	2.45	1.30	2.84	2.67	3.54	--------
1887	1.11	2.67	0.78	4.84	1.98	3.04	2.68	0.96	2.71	2.83	3.66	5.13	--------
1888	2.58	0.42	2.16	0.83	3.77	1.19	1.51	0.99	1.28	1.35	0.62	2.72	--------
1889	4.22	1.50	0.24	3.60	0.94	2.78	1.64	2.06	1.51	2.86	4.27	1.52	--------

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[1] Authority: Monthly record of observations at Melbourne Observatory (Ellery).

Temperature and precipitation in fig districts—Continued.

UPPER SACRAMENTO VALLEY, CALIFORNIA.[1]

[Latitude, 40° 10′ N.; longitude, 122° 15′ W.; elevation, 342 feet.]

MAXIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	67	79	72	77	91	94	99	107	95	87	79	70	....
1885	67	73	85	84	100	97	107	108	100	96	71	68	....
1886	64	77	75	85	95	103	109	104	106	93	78	65	....
1887	71	69	80	90	110	105	112	107	101	96	80	68	....
1888	60	82	78	93	96	99	109	108	106	92	73	61	....

MINIMUM TEMPERATURE (DEGREES FAHRENHEIT).

1884	30	32	32	42	50	52	56	55	46	42	36	25	....
1885	33	34	39	34	44	48	57	58	52	46	38	33	....
1886	30	37	35	37	46	56	55	57	52	38	33	37	....
1887	30	28	39	38	40	47	56	55	48	47	27	32	....
1888	18	34	32	41	48	49	54	55	55	44	36	35	....

MEAN TEMPERATURE (DEGREES FAHRENHEIT).

1884	46.2	45.9	51.6	56.8	68.0	69.6	78.4	81.5	67.3	62.1	54.7	47.5	....
1885	47.5	53.5	61.0	62.1	70.4	71.6	80.7	83.8	74.8	65.6	52.7	49.3	....
1886	46.2	54.5	52.8	57.7	66.9	79.1	82.6	81.5	75.6	60.7	51.3	50.0	....
1887	48.7	43.4	58.9	60.2	68.8	77.1	83.9	81.3	76.4	71.1	55.2	48.2	....
1888	40.9	53.9	54.5	67.0	68.1	70.7	81.2	82.4	80.2	67.0	54.0	48.0	....

MEAN RELATIVE HUMIDITY (PER CENT).[2]

1884	73	71	73	73	58	59	39	38	46	53	62	66	....
1885	82	69	56	61	45	47	36	30	39	53	87	86	....
1886	83	72	63	67	57	35	32	33	34	53	54	81	....
1887	64	72	68	48	44	34	36	35	32	27	46	67	....
1888	70	58	54	54	51	53	34	31	35	38	63	88	....

PRECIPITATION (INCHES).

1884	3.55	2.21	7.81	4.31	0.18	0.97	0.00	T.	0.36	0.90	0.04	7.73	28.06
1885	1.84	1.19	T.	0.62	0.64	1.37	0.05	0.00	2.91	0.10	17.05	3.86	29.63
1886	4.85	0.18	1.31	4.12	0.73	T.	T.	T.	0.00	1.76	0.34	3.92	17.21
1887	0.57	5.21	1.13	1.76	0.77	0.26	T.	T.	0.06	0.00	1.52	2.32	13.60
1888	4.08	2.17	3.47	0.53	0.51	2.61	0.07	0.00	0.33	T.	4.32	6.85	24.94

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[1] Maximum and minimum temperatures at stations in the United States are from self-registering maximum and minimum thermometers. The means have been deduced from observations three times daily—7 a. m., 3 and 11 p. m., seventy-fifth meridian time. Precipitation includes rain and melted snow.

[2] Mean of observations three times daily except from July to December, 1888, inclusive, when but two observations were made each day.

T. = Trace of precipitation.

Temperature and precipitation in fig districts—Continued.

CENTRAL SAN JOAQUIN VALLEY, CALIFORNIA.

[Latitude, 36° 43′ W.; longitude, 119° 49′ W.; elevation, 313 feet.]

MAXIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1888	68	83	77	98	96	104	109	111	111	94	78	65	....
1889	63	75	84	93	101	106	112	110	105	98	72	65	....
1890	58	70	77	92	103	104	111	105	103	88	82	70	....
1891	66	68	78	91	95	112	114	112	104	94	81	66	....
1892	69	70	78	80	104	106	110	112	104	94	......	......	....

MINIMUM TEMPERATURE (DEGREES FAHRENHEIT).

1888	20	30	28	41	46	50	51	56	54	41	35	35	....
1889	28	27	38	41	44	55	55	54	50	42	36	31	....
1890	24	28	33	36	42	46	56	56	53	42	37	28	....
1891	26	27	32	37	47	50	51	56	51	40	34	27	....
1892	30	34	36	36	41	48	55	55	52	36	......	......	....

MEAN TEMPERATURE (DEGREES FAHRENHEIT).

1888	44.1	53.2	54.1	67.1	68.6	74.1	81.7	83.0	80.7	66.5	54.3	48.2	....
1889	43.8	50.2	58.4	63.5	69.6	79.5	82.6	82.2	75.6	62.8	54.1	49.1	....
1890	42.2	47.2	54.6	61.2	69.4	73.4	82.5	80.8	74.6	64.5	56.9	43.8	....
1891	45.4	48.5	54.4	59.0	67.1	73.0	83.6	83.6	74.6	67.0	56.2	43.9	....
1892	48.5	53.2	55.6	57.6	67.2	72.8	79.4	81.4	73.6	63.9	......	......	....

MEAN RELATIVE HUMIDITY (PER CENT).

(Observations at 8 a. m. and 8 p. m., seventy-fifth meridian time).

1888	81	74	75	57	58	52	45	41	49	59	79	93	....
1889	86	71	72	62	53	43	34	29	35	67	76	86	....
1890	82	73	68	60	55	42	30	38	48	51	55	93	....
1891	79	69	69	62	52	42	30	31	41	46	59	76	....
1892	75	72	69	59	56	40	33	34	44	55	......	......	....

PRECIPITATION (INCHES).

1888	1.75	0.13	1.95	0.22	0.56	T.	T.	T.	0.06	0.00	2.38	1.71	8.76
1889	0.34	0.32	2.07	0.54	0.57	0.00	0.00	T.	0.00	3.17	1.39	3.87	12.27
1890	2.12	0.80	1.04	0.17	0.45	0.00	6.00	T.	1.26	0.00	0.22	2.30	8.36
1891	0.88	2.24	0.81	0.49	0.03	0.02	0.00	0.00	0.27	0.00	0.21	3.99	8.94
1892	0.48	1.00	1.69	0.79	1.44	0.06	0.00	0.00	T.	0.34	......	......	....

SOUTHERN CALIFORNIA, NORTHERN COAST OF.[1]

[Latitude, 34° 58′ N.; longitude, 120° 29′; elevation, 20 feet.]

MAXIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1883	72	77	72	82	92	92	79	84	98	75	80	70	....
1884	68	77	69	70	77	80	80	84	78	77	69	72	....
1885	65	73	78	76	72	74	82	87	92	84	73	74	....
1886	80	76	68	74	76	77	83	82	77	75	76	76	....
1887	72	68	76	77	80	90	85	74	75	82	74	70	....

[1] Authority, Mr. Hugh D. Vail; observations at 7 a. m., 2.09 p. m., local time.

Temperature and precipitation in fig districts—Continued.

SOUTHERN CALIFORNIA, NORTHERN COAST OF—Continued.

MINIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1883	33	31	47	44	50	52	56	55	58	47	41	40	....
1884	41	37	42	48	50	55	58	54	53	49	45	36	....
1885	41	43	48	51	52	58	58	58	59	55	46	45	....
1886	41	40	49	47	52	55	57	51	54	47	40	44	....
1887	42	43	49	48	58	58	55	58	59	58	46	43	....

MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1887	54.7	50.4	57.0	58.4	60.1	63.7	64.6	64.8	66.0	65.0	58.9	52.8	....
1889	49.0	53.8	53.0	59.9	57.6	64.4	67.0	66.3	67.9	63.5	59.1	55.8	....
1889	53.0	55.4	58.0	59.9	60.0	62.5	62.2	67.3	68.8	63.9	59.6	54.2	....
1890	48.4	52.6	55.6	55.6	60.0	62.4	67.3	67.9	66.5	64.0	53.3	58.1	....
1891	54.4	52.6	56.6	56.3	59.0	62.4	67.2	69.1	69.3	63.3	58.8	51.9	....

PRECIPITATION (INCHES.)

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1887	0.31	8.64	0.13	1.43	0.33	0.03	0.00	0.00	0.38	0.31	1.10	4.43	17.09
1888	10.15	1.30	3.85	0.16	0.02	T.	T.	T.	0.03	0.07	5.62	5.59	26.80
1889	0.29	1.29	7.31	0.49	0.76	0.13	0.00	0.00	0.00	8.65	3.21	10.64	32.77
1890	5.32	2.96	1.10	0.31	0.18	0.06	0.00	0.00	1.50	0.05	0.48	3.53	15.49
1891	0.45	7.92	1.56	1.57	0.30	0.00	0.00	0.00	0.15	0.00	0.00	2.43	14.38

SOUTHERN CALIFORNIA, SOUTHERN COAST OF.

[Latitude, 33° 43′ N.; longitude, 117° 10′ W.; elevation, 66 feet.]

MAXIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	78	79	68	69	72	81	84	92	78	87	74	68	....
1885	68	76	81	83	73	74	82	89	90	88	76	79	....
1886	74	80	68	71	72	75	81	82	78	75	77	76	....
1887	74	76	82	80	79	78	79	77	79	85	82	74	....
1888	64	67	72	93	70	76	77	82	82	80	75	73	....

MINIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	39	38	43	45	47	50	54	54	51	47	42	36	....
1885	38	40	42	47	52	52	58	62	56	47	42	40	....
1886	35	44	41	45	50	54	57	61	60	47	40	40	....
1887	38	38	44	44	48	54	60	54	58	50	44	36	....
1888	33	42	41	47	52	54	55	57	58	53	46	44	....

MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	55.0	55.9	56.5	57.6	61.4	64.4	68.4	69.5	65.1	61.3	58.6	54.4	60.7
1885	54.0	55.4	59.6	62.0	63.3	64.3	67.6	71.8	68.0	63.9	59.6	57.1	62.2
1886	55.9	58.5	55.0	57.2	60.4	63.1	67.1	70.5	66.6	59.7	56.0	56.0	60.5
1887	54.3	52.9	57.2	59.0	62.1	64.6	66.5	66.2	65.7	64.5	59.2	54.6	60.6
1888	51.6	54.9	55.8	60.8	61.2	66.0	68.4	69.2	69.7	65.0	59.9	58.2	61.7

MEAN RELATIVE HUMIDITY (PER CENT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	63	72	76	80	80	78	78	78	75	77	77	78	....
1885	76	78	73	76	77	75	76	76	81	85	82	74	....
1886	74	71	77	76	79	81	78	79	84	82	70	82	....
1887	70	75	79	76	74	80	81	80	84	72	77	71	....
1888	76	77	81	80	77	83	82	84	89	91	86	86	....

PRECIPITATION (INCHES).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	1.34	9.05	6.23	2.84	2.17	0.31	0.00	T.	0.07	0.35	0.11	5.12	27.59
1885	0.35	0.02	0.78	1.20	0.61	0.06	T.	0.13	T.	0.31	1.56	0.71	5.73
1886	6.95	1.51	3.73	1.95	0.04	0.07	T.	T.	0.00	0.05	0.95	0.10	15.35
1887	0.04	4.51	0.02	2.14	0.47	0.04	0.01	T.	T.	T.	2.08	1.14	10.45
1888	1.96	1.48	2.79	0.19	0.22	0.04	0.01	T.	0.04	0.26	1.83	2.84	11.57

Temperature and precipitation in fig districts—Continued.

YUMA, ARIZ.

[Latitude 32° 45′; longitude 114° 36′ W.; elevation 141 feet.]

MAXIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	72	84	81	95	104	113	112	112	104	100	87	78	....
1885	78	84	87	96	110	104	110	114	107	106	86	78	....
1886	80	83	88	93	108	110	112	112	104	93	81	79	....
1887	76	83	92	97	104	116	114	112	105	108	91	72	....
1888	79	85	87	102	102	107	114	110	111	105	82	75	....

MINIMUM TEMPERATURE (DEGREES FAHRENHEIT).

1884	37	34	43	45	49	58	68	68	56	50	43	36	....
1885	36	38	43	51	57	60	67	70	62	51	41	40	....
1886	30	44	38	45	54	64	69	75	62	47	32	34	....
1887	30	35	43	44	44	59	66	60	62	48	38	27	....
1888	27	39	37	47	54	60	63	70	67	49	38	40	....

MEAN TEMPERATURE (DEGREES FAHRENHEIT).

1884	54.6	57.3	60.9	67.4	78.3	81.7	90.6	88.9	80.0	71.7	63.3	53.0	70.4
1885	52.6	59.8	67.2	70.7	78.2	81.2	89.1	90.5	84.7	74.7	63.3	57.5	72.5
1886	55.0	62.7	60.5	67.4	80.1	84.0	90.8	89.6	84.2	67.4	57.8	59.3	71.6
1887	55.6	56.1	69.9	69.8	77.2	85.9	92.0	90.9	84.7	75.8	63.9	53.1	72.9
1888	51.6	60.5	62.5	75.3	76.9	85.6	91.4	91.0	89.2	74.9	61.9	57.0	73.2

MEAN RELATIVE HUMIDITY (PER CENT).

1884	41	55	50	45	41	42	43	49	46	54	60	72	....
1885	57	55	55	53	49	50	60	65	65	61	68	57	....
1886	62	45	50	49	42	50	47	62	49	53	43	48	....
1887	47	57	60	64	59	43	45	49	56	48	57	56	....
1888	56	55	48	37	38	30	41	43	48	56	68	68	....

PRECIPITATION (INCHES).

1884	T.	1.58	1.48	0.07	0.44	T.	0.01	0.32	T.	T.	T.	1.96	5.86
1885	T.	0.02	T.	0.07	T.	0.00	0.05	0.86	0.00	0.00	1.71	0.01	2.72
1886	1.06	0.08	0.33	0.31	0.00	0.00	T.	2.23	0.00	1.11	0.23	0.00	5.35
1887	0.00	T.	0.00	0.20	T.	0.01	T.	T.	1.09	0.02	2.43	0.15	3.90
1888	0.18	0.05	0.05	T.	0.00	0.00	0.04	T.	0.01	0.99	0.68	0.95	2.95

PHOENIX, ARIZ.

[Latitude 33° 28′ N.; longitude 112° 0′ W.]

MAXIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1881	73	84	91	97	99	104	106	104	97	93	77	77	....
1882	74	72	90	105	102	109	114	114	108	99	92	95	....
1883	87	80	92	99	107	119	112	116	114	96	90	87	....
1884	79	88	79	96	104	114	115	115	105	100	97	83	....
1885	82	86	91	99	113	110	113	115	113	105	96	89	....

MINIMUM TEMPERATURE (DEGREES FAHRENHEIT).

1881	22	25	28	42	47	52	65	59	48	34	26	25	....
1882	19	23	32	36	50	54	69	65	45	41	24	24	....
1883	13	23	38	30	41	55	65	68	51	34	26	20	....
1884	20	19	30	33	36	48	56	52	39	42	34	25	....
1885	22	22	28	30	35	33	46	49	44	40	31	20	....

Temperature and precipitation in fig districts—Continued.

PHOENIX, ARIZ.—Continued.

MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1881	45.5	55.4	58.4	69.3	75.6	82.9	87.7	85.1	77.1	66.5	51.7	51.5	....
1882	44.1	51.0	62.0	67.1	77.2	83.6	91.6	88.6	81.7	69.8	59.7	57.9	....
1883	47.0	52.1	64.5	62.1	71.3	85.4	89.0	88.0	81.3	67.2	58.5	55.5	....
1884	50.6	52.5	54.5	63.0	71.2	79.6	87.7	83.7	73.6	72.1	61.6	51.9	....
1885	50.2	54.8	59.9	65.0	68.9	71.6	82.3	83.1	79.3	70.6	56.3	53.5	....

MEAN RELATIVE HUMIDITY (PER CENT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1878	43	44	49	51	37	32	37	54	39	31	46	45	....
1879	......	......	......	......	......	......	40	37	33	50	43	65	....
1880	62	55	54	45	34	32	42	42	38	39	43	65	....
1881	52	47	50	41	36	39	44	55	48	41	42	46	....

PRECIPITATION (INCHES),

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1881	0.00	0.20	1.46	1.10	0.12	0.00	2.03	2.19	1.04	0.25	0.36	0.16	6.91
1882	1.62	0.17	0.00	0.00	0.00	0.37	0.32	1.81	1.25	0.10	1.30	0.00	6.94
1883	0.83	1.27	1.16	T.	0.44	0.00	0.07	0.07	0.00	0.20	0.00	3.36	7.40
1884	0.16	2.46	2.14	0.40	0.01	0.15	0.07	1.84	1.50	1.12	0.24	2.74	12.83
1885	0.00	0.47	0.33	0.00	0.65	0.04	0.18	0.71	0.07	0.09	0.91	0.32	3.77

NEW ORLEANS, LA.

[Latitude 29° 58′; longitude 90° 4′ W.; elevation 52 feet.]

MAXIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	72	77	80	82	86	91	95	93	92	90	76	76	....
1885	75	75	77	83	87	92	92	93	92	80	85	74	....
1886	72	74	81	86	91	92	93	95	92	87	82	72	....
1887	78	82	81	87	91	91	96	94	94	86	80	77	....
1888	80	79	78	85	88	92	96	94	91	87	85	72	....

MINIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	22	33	41	50	62	68	71	66	70	49	42	29	....
1885	28	30	36	52	60	72	74	70	66	49	40	30	....
1886	15	25	40	41	57	70	71	68	62	45	34	27	....
1887	21	44	44	48	62	66	70	71	60	42	34	29	....
1888	29	35	41	56	60	66	72	70	56	55	41	31	....

MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	47.1	60.7	64.8	68.2	76.4	79.4	85.4	82.3	80.9	74.4	59.7	58.7	69.8
1885	52.1	53.1	58.4	70.5	73.9	82.2	82.9	80.4	77.1	65.7	59.7	53.1	67.4
1886	45.5	53.2	58.6	65.6	72.6	78.7	79.8	81.4	77.8	69.5	59.1	51.6	66.1
1887	51.4	65.2	62.1	67.9	75.2	78.3	80.5	81.0	77.3	68.1	61.1	52.9	68.4
1888	55.6	58.6	60.3	69.9	72.8	77.3	83.6	81.0	77.6	70.8	61.8	53.8	68.6

MEAN RELATIVE HUMIDITY (PER CENT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	71	70	72	69	72	72	70	69	74	72	67	77	....
1885	72	66	68	75	73	72	74	84	86	74	75	78	....
1886	80	68	76	76	74	82	80	77	81	72	74	74	....
1887	74	81	70	71	74	79	81	80	77	74	74	81	....
1888	80	80	72	77	77	79	77	87	79	79	79	79	....

PRECIPITATION (INCHES).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	4.35	3.16	8.24	6.48	4.33	8.60	4.12	0.87	3.12	5.60	3.13	8.01	60.01
1885	9.70	2.39	6.99	3.67	5.77	3.30	6.15	4.25	13.55	0.56	3.47	4.38	64.18
1886	7.53	1.96	8.41	5.60	3.07	9.30	4.35	2.40	4.09	0.22	5.33	2.57	54.83
1887	4.26	5.58	3.37	1.87	3.99	11.33	7.85	7.42	6.51	4.71	0.52	7.56	64.97
1888	3.20	11.21	6.45	1.89	9.75	9.09	2.02	22.74	4.15	7.36	1.50	3.68	83.13

Temperature and precipitation in fig districts—Continued.

JACKSONVILLE, FLA.

[Latitude, 30° 20′ N.; longitude, 81° 39′ W.; elevation, 43 feet.]

MAXIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	72	79	85	88	91	92	96	94	89	92	79	75	....
1885	78	73	79	88	89	96	95	94	92	85	81	76	....
1886	73	73	84	86	92	94	94	94	92	87	82	76	....
1887	76	84	80	89	91	95	100	97	95	88	78	76	....
1888	81	82	84	88	93	96	98	96	92	86	83	74	....

MINIMUM TEMPERATURE (DEGREES FAHRENHEIT)).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	21	37	42	47	62	62	69	70	64	49	39	33	....
1885	32	32	38	47	56	68	71	70	68	49	36	32	....
1886	15	24	37	44	56	67	70	65	66	44	36	27	....
1887	22	38	36	38	55	64	69	68	55	40	26	31	....
1888	28	32	35	49	56	64	68	67	55	50	38	28	....

MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	51.7	62.1	66.3	68.7	76.5	76.9	82.9	79.8	77.8	72.8	61.7	58.4	69.6
1885	56.2	54.5	57.6	67.8	73.7	80.1	82.4	80.7	78.3	67.6	60.3	53.3	67.7
1886	50.7	53.5	59.9	66.5	75.8	80.7	80.9	80.4	78.6	68.9	59.1	52.8	67.3
1887	49.8	64.4	59.5	67.0	73.6	77.9	81.8	80.8	76.1	70.1	60.9	55.6	68.1
1888	57.2	60.2	60.3	70.1	74.2	79.2	81.9	82.5	77.0	69.9	61.6	53.6	69.0

MEAN RELATIVE HUMIDITY (PER CENT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	77	75	73	66	73	79	76	80	82	78	80	86	....
1885	79	73	74	74	77	81	75	79	85	77	75	74	....
1886	79	78	78	74	69	77	80	82	82	80	76	83	....
1887	83	84	74	73	74	76	76	79	80	80	79	85	....
1888	79	82	73	73	74	72	75	79	85	83	86	83	....

PRECIPITATION (INCHES).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	4.78	2.45	2.63	2.32	5.45	6.89	6.02	5.21	5.68	4.12	5.43	4.04	55.02
1885	7.18	5.23	5.66	1.24	7.74	8.98	7.16	7.56	19.63	3.36	0.50	7.76	82.00
1886	2.81	1.87	6.74	3.08	2.81	4.78	14.97	6.25	4.91	2.47	0.97	3.20	54.86
1887	4.31	0.31	3.51	1.15	7.15	9.68	8.90	5.76	9.40	1.57	0.10	3.70	58.60
1888	0.49	4.38	1.57	0.93	5.46	2.92	8.30	4.89	11.15	6.00	4.16	2.88	53.13

GALVESTON, TEX.

[Latitude, 29° 18′ N.; longitude, 94° 47′ W.; elevation, 40 feet.]

MAXIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	70	75	77	81	84	91	95	93	90	87	75	72	....
1885	73	70	74	84	88	92	94	92	91	82	80	72	....
1886	69	71	71	80	87	90	92	94	89	83	85	72	....
1887	75	75	9	81	87	88	93	91	88	84	76	74	....
1888	68	72	75	78	86	90	91	94	87	85	82	71	....

MINIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	22	28	41	48	60	66	76	71	74	57	44	29	....
1885	23	28	43	69	58	73	75	72	68	49	46	34	....
1886	11	32	38	43	60	67	68	71	61	50	34	25	....
1887	24	47	46	51	57	68	67	71	57	48	37	39	....
1888	23	40	42	56	62	69	74	71	65	54	42	40	....

Temperature and precipitation in fig districts—Continued.

GALVESTON, TEX.—Continued.

MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1884	46.7	60.4	64.8	67.2	75.9	81.4	85.2	83.8	83.5	74.8	61.9	57.6	....
1885	50.6	52.6	60.7	71.9	76.2	84.1	84.9	84.2	79.9	69.7	64.9	57.6	....
1886	47.3	53.5	59.0	66.5	74.6	80.3	82.8	83.2	80.1	71.6	62.0	56.2	....
1887	51.2	62.9	65.2	69.4	75.9	79.9	82.9	83.1	79.7	69.4	64.0	53.5	....
1888	49.8	58.8	60.1	71.2	74.8	80.2	83.0	82.6	78.2	73.1	61.6	57.4	....

MEAN RELATIVE HUMIDITY (PER CENT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1884	78	79	78	78	78	74	76	73	74	75	76	84	....
1885	82	80	79	83	76	71	73	75	82	71	76	78	....
1886	86	78	80	81	78	80	75	76	79	73	75	81	....
1887	78	84	75	76	78	76	74	74	73	72	71	82	....
1888	89	82	78	86	78	79	76	78	77	79	85	73	....

PRECIPITATION (INCHES).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1884	5.11	0.89	4.84	5.85	8.42	6.84	1.16	1.77	7.04	7.37	4.25	9.44	62.68
1885	6.97	2.04	3.17	4.12	6.41	3.28	2.20	1.74	26.01	2.20	2.32	2.10	62.56
1886	3 45	2.31	3.19	2.15	0.03	6.19	1.20	2.46	13.31	1.93	2.65	2.10	40.97
1887	1.19	1.86	1.98	0.01	4.84	8.28	1.62	6.43	2.52	4.37	0.05	10.28	43.43
1888	2.70	7.54	2.84	3.13	5.18	9.77	1.54	14.46	3.32	5.67	6.73	3.00	65.85

ATLANTA, GA.

[Latitude, 33° 45′ N.; longitude, 84° 23′ W.; elevation, 1,129 feet.]

MAXIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	64	73	76	82	85	89	90	89	88	91	70	66	....
1885	64	69	70	83	83	90	91	90	87	74	73	69	....
1886	60	65	73	82	90	90	92	94	90	84	75	65	....
1887	69	74	75	88	89	97	100	91	95	82	72	65	....
1888	71	68	77	84	88	93	94	96	87	79	77	63	....

MINIMUM TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	−1	11	24	35	55	57	65	60	52	34	30	11	....
1885	14	8	20	36	46	57	59	59	53	37	29	21	....
1886	−2	8	27	32	44	60	58	62	53	34	28	15	....
1887	9	29	25	36	57	57	59	55	45	30	16	15	....
1888	15	13	24	40	44	55	65	62	43	40	28	21	....

MEAN TEMPERATURE (DEGREES FAHRENHEIT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	35.7	51.0	54.2	58.1	70.9	70.8	78.0	75.1	74.9	67.8	51.6	45.1	....
1885	39.9	39.5	47.0	61.1	66.1	76.4	78.2	76.5	69.5	56.5	50.2	42.7	....
1886	36.1	41.9	50.1	60.4	68.1	72.5	75.8	76.1	72.9	62.3	50.6	40.7	....
1887	39.6	52.7	50.7	62.7	72.0	75.9	77.6	76.2	72.1	59.6	52.5	42.3	....
1888	45.0	49.0	50.6	64.1	68.6	74.8	79.2	78.5	68.8	58.2	52.4	43.5	....

MEAN RELATIVE HUMIDITY (PER CENT).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	71	63	66	59	59	75	71	71	61	63	57	73	....
1885	66	62	56	55	69	71	74	75	81	76	70	61	....
1886	74	58	64	65	66	80	76	79	75	61	62	75	....
1887	73	86	77	50	65	63	77	73	62	65	60	73	....
1888	74	76	63	53	69	70	74	75	82	77	76	70	....

PRECIPITATION (INCHES).

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1884	5.20	5.84	9.70	5.86	1.33	10.73	2.42	2.06	0.08	0.70	2.84	6.09	....
1885	8.44	4.14	4.26	1.31	6.12	4.83	4.02	6.92	6.51	3.94	3.98	2.64	....
1886	7.33	1.53	11.16	2.52	6.21	8.68	2.08	2.36	0.53	0.03	5.32	3.03	....
1887	3.52	3.74	1.99	1.38	1.76	2.82	14.11	7.51	4.20	3.28	0.30	5.79	....
1888	3.89	5.91	8.16	1.34	6.86	4.71	1.85	3.89	14.26	3.99	4.70	5.42	....

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